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<b>(21) International Application Number:</b> PCT/JP98/02445 <b>(22) International Filing Date:</b> 3 June 1998 (03.06.98)  <b>(30) Priority Data:</b> 9/144948 3 June 1997 (03.06.97) JP  <b>(71) Applicants (for all designated States except US):</b> SAGAMI CHEMICAL RESEARCH CENTER [JP/JP]; 4-1, Nishi-Ohnuma 4-chome, Sagamihara-shi, Kanagawa 229-0012 (JP). PROTEGENE INC. [JP/JP]; 2-20-3, Naka-cho, Meguro-ku, Tokyo 153-0065 (JP).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> KATO, Seishi [JP/JP]; 3-46-50, Wakamatsu, Sagamihara-shi, Kanagawa 229-0014 (JP). SEKINE, Shingo [JP/JP]; Remonzu 101, 2-8-15, Atago, Ageo-shi, Saitama 362-0034 (JP). YAMAGUCHI, Tomoko [JP/JP]; 5-13-11, Takasago, Katsushika-ku, Tokyo 125-0054 (JP).  <b>(74) Agents:</b> AOYAMA, Tamotsu et al.; Aoyama & Partners, IMP Building, 3-7, Shiromi 1-chome, Chuo-ku, Osaka-shi, Osaka 540-0001 (JP).		<b>(81) Designated States:</b> AU, CA, JP, MX, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>
<b>(54) Title:</b> HUMAN PROTEINS HAVING TRANSMEMBRANE DOMAINS AND DNAs ENCODING THESE PROTEINS  <b>(57) Abstract</b>  Proteins comprising any of the amino acid sequences of SEQ ID NOS: 1 to 18 and DNAs encoding said proteins and comprising any of the nucleotide sequences of SEQ ID NOS: 19 to 36 are provided.		

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## DESCRIPTION

Human Proteins Having Transmembrane  
Domains and DNAs Encoding These Proteins

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FIELD OF THE INVENTION

The present invention relates to human proteins having transmembrane domains and cDNAs encoding these proteins. The membrane proteins of this invention can be used as pharmaceuticals or as antigens for preparing antibodies against said proteins. The cDNAs of the invention can be used as probes for the gene diagnosis and gene sources for the gene therapy. The cDNAs can also be used as gene sources for large-scale production of the membrane proteins encoded by the same. The cells into which the genes encoding the membrane proteins are introduced for expression of such membrane proteins in large amounts can be used for detection of the corresponding ligands, screening of low molecular weight medicines, etc.

20 BACKGROUND OF THE INVENTION

Membrane proteins play important roles as signal receptors, ion channels, transporters, etc. for the material transportation or information transmission mediated by the cell membrane. For instance, they are known to serve as receptors for various cytokines, ion channels for sodium ion, potassium ion, chloride ion, etc., transporters for saccharides and amino acids, and so on. The genes for many of them have been cloned already.

In recent years, it was clarified that the abnormalities

of these membrane proteins are related to a number of hitherto cryptogenic diseases. For example, a gene for a membrane protein having 12 transmembrane domains was identified as the gene responsible for cystic fibrosis [Rommens, J. M. et al.,  
5 Science 245: 1059-1065 (1989)]. It was also clarified that several membrane proteins act as the receptors when a virus infects the cells. For example, HIV-1 was revealed to infect into the cells through the mediation of a membrane protein fusin, a membrane protein on the T-cell membrane, having a CD-4  
10 antigen and 7 transmembrane domains [Feng, Y. et al., Science 272: 872-877 (1996)]. Therefore, the discovery of new membrane proteins is anticipated to lead to the elucidation of the causes of many diseases, and the isolation of new genes coding for the membrane proteins is desired.

15 Heretofore, owing to the difficulty in their purification, many of membrane proteins have been isolated by an approach from the gene side. A general method is the so-called expression cloning which comprises transfection of a cDNA library in the animal cells to express the cDNA and detection  
20 of the cells expressing the target membrane protein on the membrane by an immunological technique using an antibody or a physiological technique for the change in the membrane permeability. However, this method is applicable only to cloning of a gene for a membrane protein with a known function.

25 In general, membrane proteins possess hydrophobic trans-membrane domains inside the proteins which are synthesized in the ribosome. Said domains remain in the phospholipid to be trapped in the membrane. Accordingly, the evidence of the cDNA for encoding the membrane protein is provided by determination

of the whole base sequence of a full-length cDNA and detection of highly hydrophobic transmembrane domains in the amino acid sequence of the protein encoded by said cDNA.

As a result of the extensive study, there have successfully been obtained human proteins having transmembrane domains, particularly comprising any of the amino acid sequences of SEQ ID NOS: 1 to 18, by cloning cDNAs coding for proteins having transmembrane domains, particularly comprising any of the nucleotide sequences of SEQ ID NOS: 19 to 36, from a human full-length cDNA bank. The present invention is based on the above success.

#### SUMMARY OF THE INVENTION

A main object of the present invention is to provide novel human proteins having transmembrane domains, particularly comprising any of the amino acid sequences of SEQ ID NOS: 1 to 18. Another object of this invention is to provide DNAs coding for said novel proteins, particularly comprising any of the nucleotide sequences of SEQ ID NOS: 19 to 36. A further object of the invention is to provide expression vectors capable of in vitro translating said DNAs or expressing said DNAs in eukaryotic cells. A still further object of the invention is to provide transformed eukaryotic cells capable of expressing said DNAs to produce said proteins.

In one embodiment, the present invention provides a composition comprising a protein, wherein said protein comprises an amino acid sequence selected from the group consisting of the amino acid sequences of SEQ ID NOS: 1 to 18 and their fragments.

In another embodiment, the present invention provides a composition comprising an isolated polynucleotide selected from the group consisting of the nucleotide sequences of SEQ ID NOS: 19 to 36.

5 In a further embodiment, the present invention provides a composition comprising an isolated polynucleotide selected from the group consisting of the nucleotide sequences of SEQ ID NOS: 37 to 54.

#### 10 BRIEF DESCRIPTION OF DRAWINGS

Figure 1: A figure depicting the structure of the secretory signal sequence detection vector pSSD3.

Figure 2: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP01263.

15 Figure 3: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP01299.

Figure 4: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP01347.

20 Figure 5: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP01440.

Figure 6: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP01526.

Figure 7: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10230.

25 Figure 8: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10389.

Figure 9: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10408.

Figure 10: A figure depicting the hydrophobicity/hydro-

philicity profile of the protein encoded by clone HP10412.

Figure 11: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10413.

Figure 12: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10415.

Figure 13: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10419.

Figure 14: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10424.

Figure 15: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10428.

Figure 16: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10429.

Figure 17: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10432.

Figure 18: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10433.

Figure 19: A figure depicting the hydrophobicity/hydrophilicity profile of the protein encoded by clone HP10480.

#### BEST MODE FOR CARRING OUT INVENTION

The proteins of the present invention can be obtained, for example, by isolation from human organs, cell lines, etc., by chemical synthesis on the basis of the amino acid sequences as herein disclosed, or by recombinant DNA technology using the DNA encoding the transmembrane domains of the invention. Among them, adoption of the recombinant DNA technology is preferred. Specifically, each of the proteins may be prepared by in vitro transcription of a vector comprising the cDNA of the invention

to make RNA and in vitro translation using this RNA as a template to accomplish in vitro expression. Also, each of the proteins may be prepared in a large amount by the use of *Escherichia coli*, *Bacillus subtilis*, yeasts, animal cells, etc.

5 comprising a suitable expression vector having the DNA encoding such protein.

In the case of producing the protein of the invention by the use of a microorganism such as *Escherichia coli*, the translation region of the cDNA of the invention is constructed  
10 in an expression vector having an origin, a promoter, a ribosome-binding site, a cDNA-cloning site, a terminator, etc. that can be replicated in the microorganism and, after transformation of the host cells with said expression vector, the resultant transformant is incubated, whereby the protein  
15 encoded by said cDNA can be produced in a large amount in the microorganism. In that case, a protein fragment containing an optional region can be obtained by performing the expression with inserting an initiation codon and a termination codon before and after the optional translation region. Alternative-  
20 ly, a fusion protein with another protein can be expressed. Only a protein portion encoding said cDNA can be obtained by cleavage of said fusion protein with an appropriate protease.

For production of the protein of the invention by expression of DNA coding for such protein in eukaryotic cells,  
25 the translation region of said cDNA may be recombined into an expression vector for eukaryotic cells having a promoter, a splicing domain, a poly(A) addition site, etc., followed by introduction into eukaryotic cells so that the protein of the invention is produced as a membrane protein on the cell



membrane surface. Examples of the expression vector are pKA1, pED6\_\_dpc2, pCDM8, pSVK3, pMSG, pSVL, pBK-CMV, pBK-RSV, EBV vector, pRS, pYES2, etc. As the eukaryotic cells, there are exemplified mammalian animal culture cells (e.g. simian kidney  
5 cells COS7, chinese hamster ovary cells CHO), budding yeasts, Schizosaccharomyces pombe, silkworm cells, Xenopus laevis egg cells, etc., but any other eukaryotic cells may also be used insofar as the protein of the invention can be expressed on the membrane surface. In order to introduce the expression vector  
10 into eukaryotic cells, there may be adopted any conventional procedure such as electroporation, calcium phosphate method, liposome method or DEAE dextran method.

The proteins of the present invention include peptide fragments (5 or more amino acid residues) containing any  
15 partial amino acid sequence of the amino acid sequences of SEQ ID NOS: 1 to 18. These fragments can be used as antigens for preparation of the antibodies. Also, the proteins of the invention that have signal sequences appear in the form of maturation proteins on the cell surface, after the signal  
20 sequences are removed. Therefore, these maturation proteins shall come within the scope of the present invention. The N-terminal amino acid sequences of the maturation proteins can be easily identified by using the method for the cleavage-site determination in a signal sequence [Japan Patent Kokai No.  
25 187100/96]. Further, many membrane proteins are subjected to the processing on the cell surface to be converted to the secretor forms. These secretor proteins or peptides shall come within the scope of the present invention. When glycosylation sites are present in the amino acid sequences, expression in

appropriate animal cells affords glycosylated proteins. Therefore, these glycosylated proteins or peptides also shall come within the scope of the invention.

The DNAs of the invention include all DNAs encoding the  
5 above-mentioned proteins. Said DNAs can be obtained using the method by chemical synthesis, the method by cDNA cloning, and so on.

Each of the cDNAs of the invention can be cloned from, for example, the cDNA libraries of the human cell origin. The cDNA  
10 is synthesized using as a template a poly(A)<sup>+</sup> RNA extracted from human cells. The human cells may be cells delivered from the human body, for example, by the operation or may be the culture cells. The cDNA can be synthesized by using any method selected from the Okayama-Berg method [Okayama, H. and Berg,  
15 P., Mol. Cell. Biol. 2: 161-170 (1982)], the Gubler-Hoffman method [Gubler, U. and Hoffman, J. Gene 25: 263-269 (1983)], and so on, but it is preferred to use the capping method [Kato, S. et al., Gene 150: 243-250 (1994)] as illustrated in Examples in order to obtain a full-length clone in an effective manner.

20 The primary selection of a cDNA encoding a human protein having transmembrane domains is performed by the sequencing of a partial base sequence of the cDNA clone selected at random from the cDNA libraries, sequencing of the amino acid sequence encoded by the base sequence, and recognition of the presence  
25 or absence of hydrophobic site(s) in the resulting N-terminal amino acid sequence region. Next, the secondary selection is carried out by determination of the whole base sequence by the sequencing and the protein expression by the in vitro translation. The ascertainment of the cDNA of the present

invention for encoding the protein having the secretory signal sequence is performed by using the signal sequence detection method [Yokoyama-Kobayashi, M. et al., Gene 163: 193-196 (1995)]. In other words, the ascertainment for the coding  
5 portion of the inserted cDNA fragment to function as a signal sequence is provided by fusing a cDNA fragment encoding the N-terminus of the target protein with a cDNA encoding the protease domain of urokinase and then expressing the resulting cDNA in COS7 cells to detect the urokinase activity in the cell  
10 culture medium. On the other hand, the N-terminal region is judged to remain in the membrane in the case where the urokinase activity is not detected in the cell culture medium.

The cDNAs of the invention are characterized by containing any of the nucleotide sequences of SEQ ID NOS: 19 to 36 or any  
15 of the nucleotide sequences of SEQ ID NOS: 37 to 54. Table 1 summarizes the clone number (HP number), the cells affording the cDNA, the total nucleotide number of the cDNA, and the number of the amino acid residues of the encoded protein, for each of the cDNAs.

Table 1

Sequence Number	HP Number	Cells	Number of Nucleotides	Number of Amino Acid Residues
1, 19, 37	HP01263	Liver	1502	382
2, 20, 38	HP01299	Liver	1349	317
3, 21, 39	HP01347	Liver	1643	296
4, 22, 40	HP01440	Stomach cancer	729	197
5, 23, 41	HP01526	Stomach cancer	1322	221
6, 24, 42	HP10230	Stomach cancer	3045	251
7, 25, 43	HP10389	KB	653	106
8, 26, 44	HP10408	Stomach cancer	439	78
9, 27, 45	HP10412	Stomach cancer	1131	314
10, 28, 46	HP10413	Stomach cancer	1875	195
11, 29, 47	HP10415	Stomach cancer	1563	462
12, 30, 48	HP10419	Stomach cancer	2030	247
13, 31, 49	HP10424	Stomach cancer	493	113
14, 32, 50	HP10428	KB	2044	365
15, 33, 51	HP10429	Stomach cancer	1043	226
16, 34, 52	HP10432	Liver	972	129
17, 35, 53	HP10433	Liver	695	163
18, 36, 54	HP10480	Stomach cancer	1914	193

Hereupon, the same clone as any of the cDNAs of the invention can be easily obtained by screening of the cDNA libraries constructed from the cell line or the human tissues employed in the invention, by the use of an oligonucleotide probe synthesized on the basis of the corresponding cDNA nucleotide sequence of SEQ ID NOS: 37 to 54.

In general, the polymorphism due to the individual difference is frequently observed in human genes. Therefore, any cDNA that is subjected to insertion or deletion of one or plural nucleotides and/or substitution with other nucleotides

in SEQ ID NOS: 37 to 54 shall come within the scope of the invention.

In a similar manner, any protein that is produced by these modifications comprising insertion or deletion of one or plural  
5 nucleotides and/or substitution with other nucleotides shall come within the scope of the present invention, as far as said protein possesses the activity of the corresponding protein having the amino acid sequence of SEQ ID NOS: 1 to 18.

The cDNAs of the invention include cDNA fragments (more  
10 than 10 bp) containing any partial nucleotide sequence of the nucleotide sequence of SEQ ID NOS: 19 to 36 or of the nucleotide sequence of SEQ ID NOS: 37 to 54. Also, DNA fragments consisting of a sense chain and an anti-sense chain shall come within this scope. These DNA fragments can be used  
15 as the probes for the gene diagnosis.

The present invention also provides genes corresponding to the polynucleotide sequences disclosed herein. "Corresponding genes" are the regions of the genome that are transcribed to produce the mRNAs from which cDNA polynucleotide sequences are  
20 derived and may include contiguous regions of the genome necessary for the regulated expression of such genes. Corresponding genes may therefore include but are not limited to coding sequences, 5' and 3' untranslated regions, alternatively spliced exons, introns, promoters, enhancers, and silencer or  
25 suppressor elements. The corresponding genes can be isolated in accordance with known methods using the sequence information disclosed herein. Such methods include the preparation of probes or primers from the disclosed sequence information for identification and/or amplification of genes in appropriate

genomic libraries or other sources of genomic materials. An "isolated gene" is a gene that has been separated from the adjacent coding sequences, if any, present in the genome of the organism from which the gene was isolated.

5       Organisms that have enhanced, reduced, or modified expression of the gene(s) corresponding to the polynucleotide sequences disclosed herein are provided. The desired change in gene expression can be achieved through the use of antisense polynucleotides or ribozymes that bind and/or cleave  
10 the mRNA transcribed from the gene (Albert and Morris, 1994, Trends Pharmacol. Sci. 15(7): 250-254; Lavarosky et al., 1997, Biochem. Mol. Med. 62(1): 11-22; and Hampel, 1998, Prog. Nucleic Acid Res. Mol. Biol. 58: 1-39; all of which are incorporated by reference herein). Transgenic animals that  
15 have multiple copies of the gene(s) corresponding to the polynucleotide sequences disclosed herein, preferably produced by transformation of cells with genetic constructs that are stably maintained within the transformed cells and their progeny, are provided. Transgenic animals that have modified  
20 genetic control regions that increase or reduce gene expression levels, or that change temporal or spatial patterns of gene expression, are also provided (see European Patent No. 0 649 464 B1, incorporated by reference herein). In addition, organisms are provided in which the gene(s) corresponding to  
25 the polynucleotide sequences disclosed herein have been partially or completely inactivated, through insertion of extraneous sequences into the corresponding gene(s) or through deletion of all or part of the corresponding gene(s). Partial or complete gene inactivation can be accomplished through

insertion, preferably followed by imprecise excision, of transposable elements (Plasterk, 1992, Bioessays 14(9): 629-633; Zwaal et al., 1993, Proc. Natl. Acad. Sci. USA 90(16): 7431-7435; Clark et al., 1994, Proc. Natl. Acad. Sci. USA 91(2): 719-722; all of which are incorporated by reference herein), or through homologous recombination, preferably detected by positive/negative genetic selection strategies (Mansour et al., 1988, Nature 336: 348-352; U.S. Patent Nos. 5,464,764; 5,487,992; 5,627,059; 5,631,153; 5,614, 396; 5,616,491; and 5,679,523; all of which are incorporated by reference herein). These organisms with altered gene expression are preferably eukaryotes and more preferably are mammals. Such organisms are useful for the development of non-human models for the study of disorders involving the corresponding gene(s), and for the development of assay systems for the identification of molecules that interact with the protein product(s) of the corresponding gene(s).

Where the protein of the present invention is membrane-bound (e.g., is a receptor), the present invention also provides for soluble forms of such protein. In such forms part or all of the intracellular and transmembrane domains of the protein are deleted such that the protein is fully secreted from the cell in which it is expressed. The intracellular and transmembrane domains of proteins of the invention can be identified in accordance with known techniques for determination of such domains from sequence information.

Proteins and protein fragments of the present invention include proteins with amino acid sequence lengths that are at least 25% (more preferably at least 50%, and most preferably at

least 75%) of the length of a disclosed protein and have at least 60% sequence identity (more preferably, at least 75% identity; most preferably at least 90% or 95% identity) with that disclosed protein, where sequence identity is determined  
5 by comparing the amino acid sequences of the proteins when aligned so as to maximize overlap and identity while minimizing sequence gaps. Also included in the present invention are proteins and protein fragments that contain a segment preferably comprising 8 or more (more preferably 20 or more,  
10 most preferably 30 or more) contiguous amino acids that shares at least 75% sequence identity (more preferably, at least 85% identity; most preferably at least 95% identity) with any such segment of any of the disclosed proteins.

Species homologs of the disclosed polynucleotides and  
15 proteins are also provided by the present invention. As used herein, a "species homologue" is a protein or polynucleotide with a different species of origin from that of a given protein or polynucleotide, but with significant sequence similarity to the given protein or polynucleotide, as determined by those of  
20 skill in the art. Species homologs may be isolated and identified by making suitable probes or primers from the sequences provided herein and screening a suitable nucleic acid source from the desired species.

The invention also encompasses allelic variants of the  
25 disclosed polynucleotides or proteins; that is, naturally-occurring alternative forms of the isolated polynucleotide which also encode proteins which are identical, homologous, or related to that encoded by the polynucleotides.

The invention also includes polynucleotides with sequences



complementary to those of the polynucleotides disclosed herein.

The present invention also includes polynucleotides capable of hybridizing under reduced stringency conditions, more preferably stringent conditions, and most preferably  
5 highly stringent conditions, to polynucleotides described herein. Examples of stringency conditions are shown in the table below: highly stringent conditions are those that are at least as stringent as, for example, conditions A-F; stringent conditions are at least as stringent as, for example,  
10 conditions G-L; and reduced stringency conditions are at least as stringent as, for example, conditions M-R.

Table 2

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp) <sup>‡</sup>	Hybridization Temperature and Buffer <sup>†</sup>	Wash Temperature and Buffer <sup>†</sup>
A	DNA : DNA	≥50	65°C; 1×SSC -or- 42°C; 1×SSC, 50% formamide	65°C; 0.3×SSC
B	DNA : DNA	<50	T <sub>B</sub> *; 1×SSC	T <sub>B</sub> *; 1×SSC
C	DNA : RNA	≥50	67°C; 1×SSC -or- 45°C; 1×SSC, 50% formamide	67°C; 0.3×SSC
D	DNA : RNA	<50	T <sub>D</sub> *; 1×SSC	T <sub>D</sub> *; 1×SSC
E	RNA : RNA	≥50	70°C; 1×SSC -or- 50°C; 1×SSC, 50% formamide	70°C; 0.3×SSC
F	RNA : RNA	<50	T <sub>F</sub> *; 1×SSC	T <sub>F</sub> *; 1×SSC
G	DNA : DNA	≥50	65°C; 4×SSC -or- 42°C; 4×SSC, 50% formamide	65°C; 1×SSC
H	DNA : DNA	<50	T <sub>H</sub> *; 4×SSC	T <sub>H</sub> *; 4×SSC
I	DNA : RNA	≥50	67°C; 4×SSC -or- 45°C; 4×SSC, 50% formamide	67°C; 1×SSC
J	DNA : RNA	<50	T <sub>J</sub> *; 4×SSC	T <sub>J</sub> *; 4×SSC
K	RNA : RNA	≥50	70°C; 4×SSC -or- 50°C; 4×SSC, 50% formamide	67°C; 1×SSC
L	RNA : RNA	<50	T <sub>L</sub> *; 2×SSC	T <sub>L</sub> *; 2×SSC
M	DNA : DNA	≥50	50°C; 4×SSC -or- 40°C; 6×SSC, 50% formamide	50°C; 2×SSC
N	DNA : DNA	<50	T <sub>N</sub> *; 6×SSC	T <sub>N</sub> *; 6×SSC
O	DNA : RNA	≥50	55°C; 4×SSC -or- 42°C; 6×SSC, 50% formamide	55°C; 2×SSC
P	DNA : RNA	<50	T <sub>P</sub> *; 6×SSC	T <sub>P</sub> *; 6×SSC
Q	RNA : RNA	≥50	60°C; 4×SSC -or- 45°C; 6×SSC, 50% formamide	60°C; 2×SSC
R	RNA : RNA	<50	T <sub>R</sub> *; 4×SSC	T <sub>R</sub> *; 4×SSC

‡ : The hybrid length is that anticipated for the hybridized region(s) of the hybridizing polynucleotides. When hybridizing a polynucleotide to a target polynucleotide of unknown sequence, the hybrid length is assumed to be that of the hybridizing polynucleotide. When polynucleotides of known sequence are hybridized, the hybrid length can be determined by aligning the sequences of the polynucleotides and identifying the region or regions of optimal sequence complementarity.

† : SSPE (1×SSPE is 0.15M NaCl, 10mM NaH<sub>2</sub>PO<sub>4</sub>, and 1.25mM EDTA, pH7.4) can be substituted for SSC (1×SSC is 0.15M NaCl and 15mM sodium citrate) in the hybridization and wash buffers; washes are performed for 15 minutes after hybridization is complete.

\*T<sub>B</sub> - T<sub>R</sub> : The hybridization temperature for hybrids anticipated to be less than 50 base pairs in length should be 5-10°C less than the melting temperature (T<sub>m</sub>) of the hybrid, where T<sub>m</sub> is determined according to the following equations. For hybrids less than 18 base pairs in length, T<sub>m</sub>(°C)=2(# of A + T bases) + 4(# of G + C bases). For hybrids between 18 and 49 base pairs in length, T<sub>m</sub>(°C)=81.5 + 16.6(log<sub>10</sub>[Na<sup>+</sup>]) + 0.41 (%G+C) - (600/N), where N is the number of bases in the hybrid, and [Na<sup>+</sup>] is the concentration of sodium ions in the hybridization buffer ([Na<sup>+</sup>] for 1×SSC=0.165M).

Additional examples of stringency conditions for polynucleotide hybridization are provided in Sambrook, J., E.F. Fritsch, and T. Maniatis, 1989, Molecular Cloning: A Laboratory

5 Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, chapters 9 and 11, and Current Protocols in Molecular Biology, 1995, F.M. Ausubel et al., eds., John Wiley & Sons, Inc., sections 2.10 and 6.3-6.4, incorporated herein by reference.

10 Preferably, each such hybridizing polynucleotide has a length that is at least 25% (more preferably at least 50%, and most preferably at least 75%) of the length of the polynucleotide of the present invention to which it hybridizes, and has at least  
15 60% sequence identity (more preferably, at least 75% identity; most preferably at least 90% or 95% identity) with the polynucleotide of the present invention to which it hybridizes, where sequence identity is  
20 determined by comparing the sequences of the hybridizing polynucleotides when aligned so as to maximize overlap and identity while minimizing sequence gaps.

25 EXAMPLE

The present invention is embodied in more detail by the following examples, but this embodiment is not intended to restrict the present invention. The basic operations and the enzyme reactions with regard to the DNA recombination are

carried out according to the literature ["Molecular Cloning. A Laboratory Manual", Cold Spring Harbor Laboratory, 1989]. Unless otherwise stated, restrictive enzymes and a variety of modification enzymes to be used were those available from Takara Shuzo Co., Ltd. The manufacturer's instructions were used for the buffer compositions as well as for the reaction conditions, in each of the enzyme reactions. The cDNA synthesis was carried out according to the literature [Kato, S. et al., Gene 150: 243-250 (1994)].

10 (1) Preparation of Poly(A)<sup>+</sup> RNA

The epidermoid carcinoma cell line KB (ATCC CRL 17), tissues of stomach cancer delivered by the operation, and liver were used for human cells to extract mRNAs. The cell line was cultured by a conventional procedure.

15 After about 1 g of human tissues was homogenized in 20 ml of a 5.5 M guanidinium thiocyanate solution, total mRNAs were prepared in accordance with the literature [Okayama, H. et al., "Methods in Enzymology" Vol. 164, Academic Press, 1987]. These mRNAs were subjected to chromatography using an oligo(dT)-  
20 cellulose column washed with 20 mM Tris-hydrochloric acid buffer solution (pH 7.6), 0.5 M NaCl, and 1 mM EDTA to obtain a poly(A)<sup>+</sup> RNA in accordance with the above-mentioned literature.

(2) Construction of cDNA Library

25 To a solution of 10 µg of the above-mentioned poly(A)<sup>+</sup> RNA in 100 mM Tris-hydrochloric acid buffer solution (pH 8) was added one unit of an RNase-free, bacterium-origin alkaline phosphatase and the resulting solution was allowed to react at 37°C for one hour. After the reaction solution underwent the

phenol extraction followed by the ethanol precipitation, the obtained pellets were dissolved in a mixed solution of 50 mM sodium acetate (pH 6), 1 mM EDTA, 0.1% 2-mercaptoethanol, and 0.01% Triton X-100. Thereto was added one unit of a tobacco-  
5 origin pyrophosphatase (Epicenter Technologies) and the resulting solution at a total volume of 100  $\mu$ l was allowed to react at 37°C for one hour. After the reaction solution underwent the phenol extraction followed by the ethanol precipitation, the thus-obtained pellets were dissolved in  
10 water to obtain a decapped poly(A)<sup>+</sup> RNA solution.

To a solution of the decapped poly(A)<sup>+</sup> RNA and 3 nmol of a DNA-RNA chimeric oligonucleotide (5'-dG-dG-dG-dG-dA-dA-dT-dT-dC-dG-dA-G-G-A-3') in a mixed aqueous solution of 50 mM Tris-hydrochloric acid buffer solution (pH 7.5), 0.5 mM ATP, 5 mM  
15 MgCl<sub>2</sub>, 10 mM 2-mercaptoethanol, and 25% polyethylene glycol were added 50 units of T4 RNA ligase and the resulting solution at a total volume of 30  $\mu$ l was allowed to react at 20°C for 12 hours. After the reaction solution underwent the phenol extraction followed by the ethanol precipitation, the thus-  
20 obtained pellets were dissolved in water to obtain a chimeric oligo-capped poly(A)<sup>+</sup> RNA.

After the vector pKA1 developed by the present inventors (Japanese Patent Kokai Publication No. 1992-117292) was digested with KpnI, an about 60-dT tail was inserted by a  
25 terminal transferase. This product was digested with EcoRV to remove the dT tail at one side and the resulting molecule was used as a vectorial primer.

After 6  $\mu$ g of the previously-prepared chimeric oligo-capped poly(A)<sup>+</sup> RNA was annealed with 1.2  $\mu$ g of the vectorial

primer, the product was dissolved in a mixed solution of 50 mM Tris-hydrochloric acid buffer solution (pH 8.3), 75 mM KCl, 3 mM MgCl<sub>2</sub>, 10 mM dithiothreitol, and 1.25 mM dNTP (dATP + dCTP + dGTP + dTTP), mixed with 200 units of a reverse transferase (GIBCO-BRL), and the resulting solution at a total volume of 20  $\mu$ l was allowed to react at 42°C for one hour. After the reaction solution underwent the phenol extraction followed by the ethanol precipitation, the thus-obtained pellets were dissolved in a mixed solution of 50 mM Tris-hydrochloric acid buffer solution (pH 7.5), 100 mM NaCl, 10 mM MgCl<sub>2</sub>, and 1 mM dithiothreitol. Thereto were added 100 units of EcoRI and the resulting solution at a total volume of 20  $\mu$ l was allowed to react at 37°C for one hour. After the reaction solution underwent the phenol extraction followed by the ethanol precipitation, the obtained pellets were dissolved in a mixed solution of 20 mM Tris-hydrochloric acid buffer solution (pH 7.5), 100 mM KCl, 4 mM MgCl<sub>2</sub>, 10 mM (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, and 50  $\mu$ g/ml bovine serum albumin. Thereto were added 60 units of *Escherichia coli* DNA ligase and the resulting solution was allowed to react at 16°C for 16 hours. To the reaction solution were added 2  $\mu$ l of 2 mM dNTP, 4 units of *Escherichia coli* DNA polymerase I, and 0.1 unit of *Escherichia coli* DNase H and the resulting solution was allowed to react at 12°C for one hour and then at 22°C for one hour.

Next, the cDNA-synthesis reaction solution was used to transform *Escherichia coli* DH12S (GIBCO-BRL). The transformation was carried out by the electroporation method. A portion of the transformant was inoculated on a 2xYT agar culture medium containing 100  $\mu$ g/ml ampicillin, which was

incubated at 37°C overnight. A colony grown on the culture medium was randomly picked up and inoculated on 2 ml of the 2xYT culture medium containing 100 µg/ml ampicillin, which was incubated at 37°C overnight. The culture medium was centrifuged  
5 to separate the cells, from which a plasmid DNA was prepared by the alkaline lysis method. After the plasmid DNA was double-digested with EcoRI and NotI, the product was subjected to 0.8% agarose gel electrophoresis to determine the size of the cDNA insert. In addition, by the use of the obtained plasmid as a  
10 template, the sequence reaction using M13 universal primer labeled with a fluorescent dye and Taq polymerase (a kit of Applied Biosystems Inc.) was carried out and the product was analyzed by a fluorescent DNA-sequencer (Applied Biosystems Inc.) to determine the base sequence of the cDNA 5'-terminal of  
15 about 400 bp. The sequence data were filed as a homo-protein cDNA bank data base.

(3) Selection of cDNAs Encoding Proteins Having  
Transmembrane Domains

The base sequence registered in the homo-protein cDNA bank  
20 data base was converted to three frames of amino acid sequences and the presence or absence of an open reading frame (ORF) beginning from the initiation codon. Then, the selection was made for the presence of a signal sequence that is characteristic to a secretory protein at the N-terminal of the  
25 portion encoded by ORF. These clones were sequenced from the both 5' and 3' directions by using the deletion method to determine the sequence of the whole base sequence. The hydrophobicity/hydrophilicity profiles were obtained for proteins encoded by ORF by the Kyte-Doolittle method [Kyte, J.

& Doolittle, R. F., J. Mol. Bio. 157: 105-132 (1982)] to examine the presence or absence of a hydrophobic region. In the case in which there is a hydrophobic region of putative transmembrane domain(s) in the amino acid sequence of an encoded protein, this protein was considered as a membrane protein.

#### (4) Construction of Secretory Signal Detection Vector pSSD3

One microgram of pSSD1 carrying the SV40 promoter and a cDNA encoding the protease domain of urokinase [Yokoyama-Kobayashi, M. et al., Gene 163: 193-196 (1995)] was digested with 5 units of BglIII and 5 units of EcoRV. Then, after dephosphorylation at the 5' terminal by the CIP treatment, a DNA fragment of about 4.2 kbp was purified by cutting off from the gel of agarose gel electrophoresis.

Two oligo DNA linkers, L1 (5'-GATCCCGGGTCACGTGGGAT-3') and L2 (5'-ATCCCACGTGACCCGG-3'), were synthesized and phosphorylated by T4 polynucleotide kinase. After annealing of the both linkers, followed by ligation with the previously-prepared pSSD1 fragment by T4 DNA ligase, *Escherichia coli* JM109 was transformed. A plasmid pSSD3 was prepared from the transformant and the objective recombinant was confirmed by the determination of the base sequence of the linker-inserted fragment. Figure 1 illustrates the structure of the thus-obtained plasmid. The present plasmid vector carries three types of blunt-end formation restriction enzyme sites, SmaI, PmaCI, and EcoRV. Since these cleavage sites are positioned in succession at an interval of 7 bp, selection of an appropriate site in combination of three types of frames for the inserting



cdNA allows to construct a vector expressing a fusion protein.

(5) Functional Verification of Secretory Signal Sequence

Whether the N-terminal hydrophobic region in the secretory protein clone candidate obtained in the above-mentioned steps functions as the secretory signal sequence was verified by the method described in the literature [Yokoyama-Kobayashi, M. et al., Gene 163: 193-196 (1995)]. First, the plasmid containing the target cdNA was cleaved at an appropriate restriction enzyme site that existed at the downstream of the portion expected for encoding the secretory signal sequence. In the case in which this restriction enzyme site was a protruding terminus, the site was blunt-ended by the Klenow treatment or treatment with the mung-bean nuclease. Digestion with HindIII was further carried out and a DNA fragment containing the SV40 promoter and a cdNA encoding the secretory sequence at the downstream of the promoter was separated by agarose gel electrophoresis. This fragment was inserted between the pSSD3 HindIII site and a restriction enzyme site selected so as to match with the urokinase-coding frame, thereby constructing a vector expressing a fusion protein of the secretory signal portion of the target cdNA and the urokinase protease domain.

After *Escherichia coli* (host: JM109) bearing the fusion-protein expression vector was incubated at 37°C for 2 hours in 2 ml of the 2xYT culture medium containing 100 µg/ml ampicillin, the helper phage M13K07 (50 µl) was added and the incubation was continued at 37°C overnight. A supernatant separated by centrifugation underwent precipitation with polyethylene glycol to obtain single-stranded phage particles. These particles were suspended in 100 µl of 1 mM Tris-0.1 mM

EDTA, pH 8 (TE). Also, there was used as a control a suspension of single-stranded particles prepared in the same manner from the vector pLAl-UPA containing pSSD3 and a full-length cDNA of urokinase [Yokoyama-Kobayashi, M. et al., Gene 163: 193-196 (1995)].

The simian-kidney-origin culture cells, COS7, were incubated at 37°C in the presence of 5% CO<sub>2</sub> in the Dulbecco's modified Eagle's culture medium (DMEM) containing 10% bovine fetus albumin. Into a 6-well plate (Nunc Inc., 3 cm in the well diameter) were inoculated  $1 \times 10^5$  COS7 cells and incubation was carried out at 37°C for 22 hours in the presence of 5% CO<sub>2</sub>. After the culture medium was removed, the cell surface was washed with a phosphate buffer solution and then washed again with DMEM containing 50 mM Tris-hydrochloric acid (pH 7.5) (TDMEM). To the cells were added 1 µl of the single-stranded phage suspension, 0.6 ml of the DMEM culture medium, and 3 µl of TRANSFECTAM<sup>TM</sup> (IBF Inc.) and the resulting mixture was incubated at 37°C for 3 hours in the presence of 5% CO<sub>2</sub>. After the sample solution was removed, the cell surface was washed with TDMEM, 2 ml per well of DMEM containing 10% bovine fetus albumin was added, and the incubation was carried out at 37°C for 2 days in the presence of 5% CO<sub>2</sub>.

To 10 ml of 50 mM phosphate buffer solution (pH 7.4) containing 2% bovine fibrinogen (Miles Inc.), 0.5% agarose, and 1 mM potassium chloride were added 10 units of human thrombin (Mochida Pharmaceutical Co., Ltd.) and the resulting mixture was solidified in a plate of 9 cm in diameter to prepare a fibrin plate. Ten microliters of the culture supernatant of the

transfected COS7 cells were spotted on the fibrin plate, which was incubated at 37°C for 15 hours. The diameter of the thus-obtained clear circle was taken as an index for the urokinase activity. In the case in which a cDNA fragment codes for the amino acid sequence that functions as a secretory signal sequence, a fusion protein is secreted to form a clear circle by its urokinase activity. Therefore, in the case in which a clear circle is not formed, the fusion protein remains as trapped in the membrane and the cDNA fragment is considered to code for a transmembrane domain.

#### (6) Protein Synthesis by In Vitro Translation

The plasmid vector carrying the cDNA of the present invention was utilized for the transcription/translation by the T<sub>N</sub>T rabbit reticulocyte lysate kit (Promega Biotec). In this case, [<sup>35</sup>S]methionine was added and the expression product was labeled with the radioisotope. All reactions were carried out by following the protocols attached to the kit. Two micrograms of the plasmid was allowed to react at 30°C for 90 minutes in total 25 ml of a reaction solution containing 12.5 µl of the T<sub>N</sub>T rabbit reticulocyte lysate, 0.5 µl of the buffer solution (attached to the kit), 2 µl of an amino acid mixture (methionine-free), 2 µl (0.37 MBq/µl) of [<sup>35</sup>S]methionine (Amersham Corporation), 0.5 µl of T7 RNA polymerase, and 20 U of RNasin. To 3 µl of the reaction solution was added 2 µl of an SDS sampling buffer (125 mM Tris-hydrochloric acid suffer solution, pH 6.8, 120 mM 2-mercaptoethanol, 2% SDS solution, 0.025% bromophenol blue, and 20% glycerol) and the resulting solution was heated at 95°C for 3 minutes and then subjected to SDS-polyacrylamide gel electrophoresis. The molecular weight of

the translation product was determined by carrying out the autoradiography.

(7) Expression in COS7

Escherichia coli bearing a vector expressing the protein  
 5 of the invention was infected with helper phage M13K07, and  
 single-stranded phage particles were obtained according to the  
 method as stated above. Using the thus obtained phages, each  
 expression vecotr was introduced into simian-kidney-origin  
 culture cells COS7 in the manner as stated above. After  
 10 incubation at 37 °C for 2 days in the presence of 5 % CO<sub>2</sub>,  
 further incubation was carried out in a medium containing  
 [<sup>35</sup>S]cysteine or [<sup>35</sup>S]methionine for 1 hour. The cells were  
 collected, dissolved and then subjected to SDS-PAGE whereby a  
 band corresponding to the expression product of each protein  
 15 which is not present in COS7 cells was revealed. In Table 3,  
 the molecular weight of each expression product is shown.

Table 3

20	HP Number	Supernatant of culture	Membrane fraction
		(kDa)	(kDa)
	HP01263	50	-
	HP01299	-	30
	HP01526	-	22
25	HP10230	-	24
	HP10408	-	7
	HP10415	-	45
	HP10424	-	14
	HP10429	-	27
30	HP10432	-	17
	HP10480	-	22

## (8) Clone Examples

<HP01263> (Sequence Number 1, 19, 37)

Determination of the whole base sequence for the cDNA insert of clone HP01263 obtained from the human liver cDNA libraries revealed the structure consisting of a 5'-non-translation region of 36 bp, an ORF of 1149 bp, and a 3'-non-translation region of 316 bp. The ORF codes for a protein consisting of 382 amino acid residues with one transmembrane domain at the N-terminal. Figure 2 depicts the hydrophobicity /hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. The in vitro translation resulted in formation of a translation product of 42 kDa, which is almost consistent with the molecular weight of 42,054 as predicted from the ORF. On expression in COS cells, an expression product of about 50 kDa was observed in the culture supernatant. Therefore, said protein can be understood to be a secreted protein. Application of the rule (-3, -1) as a method for anticipation of a cutting site in a secretion signal sequence suggested that the mature protein would start from methionine at 19 position.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the human  $\alpha$ -2-HS-glycoprotein (SWISS-PROT Accession No. P02765). Table 4 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the human  $\alpha$ -2-HS-glycoprotein (GP). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the

Table 4

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HP  MGLLLPLALCILVLCGAMSPQALNPSALLSR--GCNDSVDLAVAGFALRDINKDRKD
      .*. **   .   . *   . . . *   . * . * . . . . *   .   . * .   . * . .
GP  MKSLVLLLLCLAQLWGCBSAPHGPGLIYRQPNCCDPETEEAALVAIDYINQNLFW
HP  GYVLRRLNRVNDAQEYRRGGLGSLFYLTLDVLETDCHVLRKKAQWDCGMRIFFE-SVYGQC
      **   ** . . . . .   .   . * . **   . . . . * . * . * . * . * . *
GP  GYKHTLNQIDEVKVWPQQPSGELFEIEIDTLETTCHVLDPTPVARCSVRQLKEHAVEGDC
HP  K-AIFYMNNPSRVLYLAAYNCTLRPVSKKKIYMTCPDCPSSIPTDSSNHQVLEAATESLA
      .   . . .   . * . *   . * .   . * *   . . . * . * . * . * . * . * . *
GP  DFQLKLKLDGKFSVVY--AKCDSSPDSAEDVRKVCQDCPLLAPLN--DTRVVHAAKAALA
HP  KYNNESTSKQYSLFKVTRASSQWVVGPSYFVEYLKESPC---TKSQASSCSLQSSDSVP
      . * . * . . . . *   . . . * .   .   . **   . * .   .   . * . * . * . *   . .
GP  AFNAQNNGSNFQLEEISRAQLV-PLPPSTYVEFTVSGTDCVAKEATEAAKCNLLAEKQY-
HP  VGLCKGSLTRTHWEKFVSVTCDFFESQAPATGSENSAVNQK-PTNLPKVEESQQKNTPTPT
      * . * . * . *   .   . * . * . * . * . * .   . .   . * .   .   . .   . .
GP  -GFCKATLSEKLGAEVAVTCTVFQTQPVTSQPQPEGANEAVPTPVVDPDAPPSPLGAP
HP  DSPSKAGPRGSVQYLPDLDDKNSQEKGPQEAFFVHLDLTNPNQGETLDISFLFLEPMEEK
      . * .   . * . * . *   .   . * .
GP  GLPPAGSPPDSHVLLAAPPQHQLHRAHYDLRHTFMGVVSLGSPSGEVSHPRKTRTVVQPS
HP  LVVLFPFKEKARTAECGPAQNASPLVLP
GP  VGAAAGPVVPPCPGRIRHFKV

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Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. H57204), but it can not be assessed whether these ESTs with  
5 partial sequences code for the same protein as the protein of the present invention. Hereupon, most of ESTs matching with the present cDNA are available from liver cDNA libraries, whereby the present clone is considered to be expressed specifically in the liver.

10 The present protein, because of being a type-II membrane protein, is considered to exert its function as a receptor on the membrane surface with the C-terminal side exposed outside the cells or after undergoing a processing followed by being excreted in the serum. The present protein, because of bearing  
15 a cystatin-like domain, is considered to possess a proteinase-inhibitor activity as well as many physiological activities in the same manner as for other members of this family. In addition, the present protein, because of being expressed specifically in liver cells, is considered to play a  
20 significant role for maintaining the liver function.

<HP01299> (Sequence Number 2, 20, 38)

Determination of the whole base sequence for the cDNA insert of clone HP01299 obtained from the human liver cDNA libraries revealed the structure consisting of a 5'-non-  
25 translation region of 110 bp, an ORF of 954 bp, and a 3'-non-translation region of 285 bp. The ORF codes for a protein consisting of 317 amino acid residues with two or more transmembrane domains. Figure 3 depicts the hydrophobicity/hydrophilicity profile of the present protein

obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 32 kDa that was almost consistent with the molecular weight of 35,965 predicted from the ORF.

5       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the rat retinol dehydrogenase (NBRF Accession No. A55884). Table 5 indicates the comparison of the amino acid sequences between the human protein of the present invention  
10 (HP) and the rat retinol dehydrogenase (RN). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and. represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed a homology of 65.3%  
15 among the entire regions.



Table 5

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HP MWLYLAAFVGLYLLHWYRERQVVSHLQDKYVFITGCDSGFGNLLARQLDARGLRVLAAC
5 ***** *.***. **. .***.*****.*****.*****.*****.*****
RN MWLYLLALVGLWNLLRLLFRERKVVSHLQDKYVFITGCDSGFGNLLARQLDRRGMRVLAAC
HP LTEKGAEQLRGQTSRLETVTLDTVTKMESIAAATQWVKEHVGDRGLWGLVNNAGILTPIT
*****.*****.***** ***.*****.*****.*****.*****.*****
RN LTEKGAEQLRSKTSRLETVILDVTKTESIVAATQWVKERVGNRGLWGLVNNAGISVPVG
10 HP LCEWLNTEDSMNMLKVNLIQVITLSMLPLVRRARGRIVNVSSILGRVAFFVGGYCVSK
**....* ..*.***.***.***.*****.*****.***.***.***.***.***.***
RN PNEWMRKKDFASVLDVNLLGVIEVTLNMLPLVRKARGRVVNIAS TMGRMSLVGGGYCISK
HP YGVEAFSDILRREIQHFGVKISIVEPGYFRTGMTNMTQSLERMKQSWKEAPKHIKETYGQ
***** *****. .***.***.***.***.***.***.***.***.***.***.***.
15 RN YGVEAFSDSLRRELT YFGVKVAIIEPGGFKTNVTNMERLS DNKKLWDQTTEE VKEIYGE
HP QYFDALYNIMKEGLLNCSTNLNLVTD CMEHALTSVHPRTRY SAGWDAKFFFIPLSYLPTS
.. *. . *.. . **.*.*****.*****.*****.*****.*****
RN KFQDSYMKAMESLVNTCSGDSLVTDCMEHALTSCHPRTRYSPGWDAKFFYLPM SYLPTF
HP LADYILTRSWPKPAQAV
20 *.* .. .. ***.*.
RN LSDAVIHGWSVKPARAL

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Furthermore, the search of GenBank using the base sequence  
25 of the present cDNA revealed that there existed some ESTs  
possessing the homology of 90% or more (for example, Accession  
No. R35197), but any of them was shorter than the present cDNA  
and did not contain the initiation codon.

The rat retinol dehydrogenase has been found as a  
30 microsomal membrane protein participating in the retinoic acid

biosynthesis in the liver [Chai, X. et al., J. Biol. Chem. 270: 28408-28412 (1995)]. Accordingly, its homologue, the protein of the present invention, is considered to possess a similar function and can be utilized for diagnosis and treatment of diseases caused by the abnormality of this protein.

<HP01347> (Sequence Number 3, 21, 39)

Determination of the whole base sequence for the cDNA insert of clone HP01347 obtained from the human liver cDNA libraries revealed the structure consisting of a 5'-non-translation region of 24 bp, an ORF of 891 bp, and a 3'-non-translation region of 728 bp. The ORF codes for a protein consisting of 296 amino acid residues with one transmembrane domain at the N-terminal. Figure 4 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that the present protein remained in the membrane from the observation that the urokinase secretion was not identified and the urokinase activity was detected on the membrane surface, upon transduction into the COS7 cells of an expression vector in which a HindIII-SacI fragment (treated with the mung-bean nuclease) containing a cDNA fragment encoding the N-terminal 73 amino acid residues in the present protein was inserted at the HindIII-EcoRV site of pSSD3. Therefore, the present protein is considered to be a type-II membrane protein. The in vitro translation resulted in the formation of a translation product of 33 kDa that was almost consistent with the molecular weight of 33,527 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was

analogous to the human HIV envelope glycoprotein gp120-binding C-type lectin (GenBank Accession No. M98457). Table 6 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the human HIV envelope glycoprotein gp120-binding C-type lectin (CL). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed a homology of 85.6% among 284 amino acid residues. There is observed at the downstream of the transmembrane domain a sequence with seven repetition of Ile-Tyr-Gln-Xaa-Leu-Thr-Xaa-Leu-Lys-Ala-Ala-Val-Gly-Glu-Leu-Xaa-Xaa-Xaa-Ser-Lys-Xaa-Gln-Xaa.

Table 6

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	HP	MSDSKEPRVQQLGLL-----GCLGHGALVLQLLSFMLLAGVLVAI
		*****.***** *****.***** ****
5	CL	MSDSKEPRLQQLGLLEEEQLRGLGFRQTRGYKSLAGCLGHGPLVLQLLSFTLLAG----L
	HP	LVQVSKVPSSLSQESEQDAIYQNLTLKAAVGELSEKSKLQEIIYQELTLKAAVGELPE
		*****.***** *****
	CL	LVQVSKVPSSISQEQRQDAIYQNLTLKAAVGELSEKSKLQEIIYQELTLKAAVGELPE
	HP	KSKLQEIIYQELTRLKAAVGELPEKSKLQEIIYQELTRLKAAVGELPEKSKLQEIIYQELTRL
10		*****.*****.*****
	CL	KSKLQEIIYQELTRLKAAVGELPEKSKLQEIIYQELTWLKAAVGELPEKSKMQEIIYQELTRL
	HP	KAAVGELPEKSKLQEIIYQELTELKAAVGELPEKSKLQEIIYQELTLKAAVGELPDQSKQQ
		*****.*****.*****.*****.*****.*****
	CL	KAAVGELPEKSKQEIYQELTRLKAAVGELPEKSKQEIYQELTRLKAAVGELPEKSKQQ
15	HP	QIIYQELTDLKTAFERLCRHCPKDWTFQNGCYFMSNSQRNWHDSVTACQEVRAQLVVIKT
		.*****.***.***.***.*****.***.***.*****.
	CL	EIIYQELTLKAAVERLCHPCPWEWTFQNGCYFMSNSQRNWHDSITACKEVGAQLVVIKS
	HP	AEEQLPAVLEQWRTQQ
		**** *. *...
20	CL	AEEQNFLQLQSSRSNRFTWMGLSDLNQEGTWQWVDGSPLLPSFKQYWNRGEPNNVGEEDC

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Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. H90360), but it can not be assessed whether these ESTs with partial sequences code for the same protein as the protein of the present invention.

The present protein, because of being a type-II membrane protein, is considered to exert its function as a receptor on

the membrane surface with the C-terminal side exposed outside the cells or after undergoing a processing followed by being excreted in the serum. Hereupon, the human HIV envelope glycoprotein gp120-binding C-type lectin that is highly homologous with the present protein has been found as a CD4-independent HIV receptor [Curtis, B. M. et al., Proc. Natl. Acad. Sci. USA 89: 8356-8360 (1992)].

<HP01440> (Sequence Number 4, 22, 40)

Determination of the whole base sequence for the cDNA insert of clone HP01440 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 37 bp, an ORF of 594 bp, and a 3'-non-translation region of 98 bp. The ORF codes for a protein consisting of 197 amino acid residues with four transmembrane domains. Figure 5 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 21 kDa that was almost consistent with the molecular weight of 20,822 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the human tumor-associated antigen L6 (SWISS-PROT Accession No. P30408). Table 7 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the human tumor-associated antigen L6 (L6). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed

a homology of 47.0% among the entire regions.

Table 7

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5	HP	MCTGKCARCVGLSLITLCLVCIVANALLVPNGETSWTNTNHLSQLQVWLMGGFIGGGIMV
		** *****.* **..* *.**.* ** *****.....** **..*..*****..
	L6	MCYGKCARCIGHSLVGLALLCIAANILLYFPNGETKYASENHLRFVWFFSGIVGGGLIM
	HP	LCPG---IAAVRAGGKCCGAGCCGNRCRMLRSVFSSAFVGLGAIYCLSVSGAGLRNGPR
		* *. * . ... ***** . **.* **.*... *. *. **.* *.. ** .**
10	L6	LLPAFVFIGLEQDDCCGCCGHENCGKRCAMLSSVLAALIGIAGSGYCVIVAALGLAEGPL
	HP	CLMN-GEWGYHFEDTAGAYLLNRTLWDRCEAPRVFPWNVTLFSLLVAASCLEIVLCGIQ
		** . *.**.* **..*..*****. . *. **.* **.* **.* **.* . *.**.* **
	L6	CLDSLQWNYTFASTEGQYLLDTSTWSECTEPKHIVEWNVSLFSILLALGGIEFILCLIQ
	HP	LVNATIGVFCCGDCRKKQDTPH
15		..*..* **.* * ..*
	L6	VINGVLGGICGFCCSHQQQYDC

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Furthermore, the search of GenBank using the base sequence  
 20 of the present cDNA revealed that there existed some ESTs  
 possessing the homology of 90% or more and also containing the  
 initiation codon (for example, Accession No. T55097), but many  
 sequences were not distinct and the same ORF as that in the  
 present cDNA was not identified.

25 The human tumor-associated antigen L6 is a member of a  
 membrane antigen TM4 superfamily proteins which are expressed  
 in large quantities on the surface of human tumor cells  
 [Marken, J. S. et al., Proc. Natl. Acad. Sci. USA 89: 3503-3507  
 (1992)]. Since these membrane antigens are expressed  
 30 specifically on some specified cells or cancer cells,

antibodies against these antigens, if constructed, are useful for a variety of diagnoses and as carriers for the drug delivery. In addition, the cells in which genes of these membrane antigens are transduced and the membrane antigens are expressed are applicable for detection of the corresponding ligands and so on.

<HP01526> (Sequence Number 5, 23, 41)

Determination of the whole base sequence for the cDNA insert of clone HP01526 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 83 bp, an ORF of 666 bp, and a 3'-non-translation region of 573 bp. The ORF codes for a protein consisting of 221 amino acid residues with a hydrophobic region of putative six transmembrane domains. Figure 6 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 23 kDa that was almost consistent with the molecular weight of 25,030 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the mouse interstitial cell protein (GenBank Accession No. X96618). Table 8 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the mouse interstitial cell protein (MM). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed

a homology of 79.6% among the entire regions.

Table 8

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5	HP	MEAGGFSLDSLIYGACVFTLCMFSAAGLSDLRHRMTRSVQFLPFLTTEVNNLGWLSY
		***** **..***.*****.*****.*****.*****.*****.*****.*****
	MM	MEAGGVADSFLSSACVLFTLCMFSTGLSDLRHMQRTRSVQFLPFLTTDVNNLSWLSY
	HP	GALKGDGILIVNTVGAALQTLYLILAYLHYCPKRVVLLQTATLLGVLLLGYGFWLLVP
		*.*****.**..***.*****.*****.*****.*****.*****.*****
10	MM	GVLKGDGTLLIIVNSGAVLQTLYLILAYLHYSQKHGVLLQTATLLAVLLLGYGFWLLVP
	HP	NPEARLQQLGLFCSVFTISMYLSPLADLAKVIQTKSTQCLSYPLTIATLLTSASWCYGF
		.*****.*****.*****.*****.*****.*****.*****.*****.*****
	MM	DLEARLQQLGLFCSVFTISMYLSPLADLAKIVQTKSTQRLSPLTIATLFCASWSIYGF
	HP	RLRDPYIMVSNFPGIVTSFIRFWLFWKYPQEQRNYWLLQT
15		***** **..***.***.***.*** ** ***.*****.*****
	MM	RLRDPYIAPNLPGLTSLIRLGLFCKYPPEQDRKYRLIQT

---

Furthermore, the search of GenBank using the base sequence  
 20 of the present cDNA revealed that there existed some ESTs  
 possessing the homology of 90% or more and also containing the  
 initiation codon (for example, Accession No. H02682), but many  
 sequences were not distinct and the same ORF as that in the  
 present cDNA was not identified.

25 The mouse interstitial cell protein has been cloned as a  
 membrane protein that is expressed with highly increasing in  
 interstitial cells stimulated by a cytokine [Tagoh, H. et al.,  
 Biochem. Biophys. Res. Commun. 221: 744-749 (1996)]. Since  
 these membrane proteins are expressed specifically on some  
 30 specified cells and cancer cells, antibodies against these



proteins, if constructed, are useful for a variety of diagnoses and as carriers for the drug delivery. In addition, the cells in which genes of these membrane antigens are transduced and the membrane antigens are expressed are applicable for  
5 detection of the corresponding ligands and so on.

<HP10230> (Sequence Number 6, 24, 42)

Determination of the whole base sequence for the cDNA insert of clone HP10230 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-  
10 translation region of 190 bp, an ORF of 756 bp, and a 3'-non-translation region of 2099 bp. The ORF codes for a protein consisting of 251 amino acid residues with at least one transmembrane domain. Figure 7 depicts the hydrophobicity/hydrophilicity profile of the present protein  
15 obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 30 kDa that was almost consistent with the molecular weight of 28,800 predicted from the ORF.

The search of the protein data base using the amino acid  
20 sequence of the present protein revealed that the protein was analogous to the nematode hypothetical protein F25D7.1 (GenBank Accession No. Z78418). Table 9 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the nematode hypothetical protein F25D7.1  
25 (CE). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed a homology of 49.8% among the entire regions.

Table 9

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HS  MSDIGDWFRSIPAITRYWFAATVAVPLVGKGLISPAYLFL-WPEAFLYRFQIWRPITAT
      *..... ** .***** *.. **.***.***. ....** * . . ***.***.**
5   CE  MDLENFLLGIPIVTRYWFLASTIIPLLGRFGFINVQWMLQW-DLVVNKFQFWRPLTAL
HS  FYFYPVPGTGFLYLVLNLYFLYQYSTRLETGAFDGRPADYLFMLLFNW-ICIVITGLAMDM
      *.***.* *** *. *****. **.... **.*****.*** *. . .***.
CE  IYYPVTPQTGFHWLMMCYFLYNYSKALESETYRGRSADYLFMLIFNWFFCSGLC-MALDI
HS  QLLMIPLIMSVLYVWAQLNRMIVSFWFGTRFKACYLPWVILGFNYIIGGSVINELIGNL
10   *. *...***** *.*. * ***** ** * *****. *** .. *. .***.* *
CE  YFLEPMVISVLYVWCQVNKDTIVSFWFGMRFPARYLPWVLWGFNAVLRGGGTNELVGIL
HS  VGHLFYFFLMFRYPMDLGGRNFLSTPQFLYRWLPSSRRGGVSGFGVPPASMRRAADQNGGGG
      *** ***. .** . * ...***.***.* *. **.* * * * *
CE  VGHAYFFVALKYPDEYGV-DLISTPEFLHRLIPDEDGGIHG---QDGNIRGARQQPRG--
15  HS  RHNW--QGQFRLGDQ
      * * * * ***
CE  -HQWPGGVGARLGGN

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20 Furthermore, the search of GenBank using the base sequence  
of the present cDNA revealed that there existed some ESTs  
possessing the homology of 90% or more and also containing the  
initiation codon (for example, Accession No. W01493), but many  
sequences were not distinct and the same ORF as that in the  
25 present cDNA was not identified.

<HP10389> (Sequence Number 7, 25, 43)

Determination of the whole base sequence for the cDNA insert of clone HP10389 obtained from the human epidermoid carcinoma cell line KBC cDNA libraries revealed the structure consisting of a 5'-non-translation region of 62 bp, an ORF of

321 bp, and a 3'-non-translation region of 270 bp. The ORF codes for a protein consisting of 106 amino acid residues with a hydrophobic region of putative two transmembrane domains. Figure 8 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 12 kDa that was almost consistent with the molecular weight of 11,528 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was not analogous to any of known proteins. Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. H70816), but many sequences were not distinct and the same ORF as that in the present cDNA was not identified.

<HP10408> (Sequence Number 8, 26, 44)

Determination of the whole base sequence for the cDNA insert of clone HP10408 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 74 bp, an ORF of 237 bp, and a 3'-non-translation region of 128 bp. The ORF codes for a protein consisting of 78 amino acid residues with a putative signal sequence at the N-terminal as well as a sequence of one putative interior transmembrane domain. Figure 9 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that the present protein remained in the membrane from the observation that the urokinase secretion was not identified

upon transduction into the COS7 cells of an expression vector in which a HindIII-BglIII fragment (after the Klenow treatment) containing a cDNA fragment encoding the N-terminal 70 amino acid residues in the present protein was inserted at the  
5 HindIII-EcoRV site of pSSD3. The in vitro translation resulted in the formation of a translation product of 9 kDa that was almost consistent with the molecular weight of 8,396 predicted from the ORF.

Furthermore, the search of GenBank using the base sequence  
10 of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. T94049), but they were shorter than the present cDNA and any molecule containing the initiation codon was not identified.

15 <HP10412> (Sequence Number 9, 27, 45)

Determination of the whole base sequence for the cDNA insert of clone HP10412 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 55 bp, an ORF of 945 bp, and a 3'-non-  
20 translation region of 131 bp. The ORF codes for a protein consisting of 314 amino acid residues with one transmembrane domain at the N-terminal. Figure 10 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that  
25 the present protein remained in the membrane from the observation that the urokinase secretion was not identified upon transduction into the COS7 cells of an expression vector in which a HindIII-ApaI fragment (treated with mung-bean nuclease) containing a cDNA fragment encoding the N-terminal 65

amino acid residues in the present protein was inserted at the HindIII-EcoRV site of pSSD3. The in vitro translation resulted in the formation of a translation product of 44 kDa that was somewhat larger than the molecular weight of 35,610 predicted  
5 from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the nematode hypothetical protein of 28.5 kDa (SWISS-PROT Accession No. P34623). Table 10 indicates the  
10 comparison of the amino acid sequences between the human protein of the present invention (HP) and the nematode hypothetical protein of 28.5 kDa (CE). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino  
15 acid residue analogous to that in the protein of the present invention. The both proteins possessed a homology of 42.8% in the C-terminal region of 243 amino acid residues.

20

25

<HP10413> (Sequence Number 10, 28, 46)

30

cDNA libraries revealed the structure consisting of a 5'-non-translation region of 78 bp, an ORF of 588 bp, and a 3'-non-translation region of 1209 bp. The ORF codes for a protein consisting of 195 amino acid residues with one transmembrane domain at the N-terminal. Figure 11 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that the present protein remained in the membrane from the observation that the urokinase secretion was not identified upon transduction into the COS7 cells of an expression vector in which a HindIII-PmaCI fragment containing a cDNA fragment encoding the N-terminal 65 amino acid residues in the present protein was inserted at the HindIII-PmaCI site of pSSD3. The in vitro translation resulted in the formation of a translation product of 28 kDa that was somewhat larger than the molecular weight of 21,671 predicted from the ORF.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the swine steroidal membrane-binding protein (GenBank Accession No. X99714). Table 11 indicates the comparison of the amino acid sequences between the human protein of the present invention (HP) and the swine steroidal membrane-binding protein (SS). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The both proteins possessed a homology of 96.4% among the entire regions.

Table 11

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HP  MAAEDVVATGADPSDLESGLLHEIFTSPLNLLLLGLCIFLLYKIVRGDQPAASGSDDDD
*****.*****.**,*****
5  SS  MAAEDVAATGADPSELEGGLLHEIFTSPLNLLLLGLCIFLLYKIVRGDQPAAS-DSDDD
HP  EPPPLPRLKRRDFTP AELRRFDGVQDPRILMAINGKVFDTVTKGRKFYGP EGPYGVFAGRD
*****
SS  EPPPLPRLKRRDFTP AELRRFDGVQDPRILMAINGKVFDTVTKGRKFYGP EGPYGVFAGRD
HP  ASRGLATFCLDKEALKDEYDDLSDLTAAQETLSDWESQFTFKYHHVGKLLKEGEEPTVY
10 *****.*****.**,*****
SS  ASRGLATFCLDKEALKDEYDDLSDLTPAQETLNDWDSQFTFKYHHVGKLLKEGEEPTVY
HP  SDEE EPKDESARKND
*****
SS  SDEE EPKDESARKND
15

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Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. AA021062), but many sequences were not distinct and the same ORF as that in the present cDNA was not identified.

<HP10415> (Sequence Number 11, 29, 47)

Determination of the whole base sequence for the cDNA insert of clone HP10415 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 71 bp, an ORF of 1389 bp, and a 3'-non-translation region of 103 bp. The ORF codes for a protein consisting of 462 amino acid residues with one transmembrane domain at the N-terminal. Figure 12 depicts the hydrophobicity/hydrophilicity profile of the present protein



obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 48 kDa that was somewhat smaller than the molecular weight of 52,458 predicted from the ORF.

5       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the cytochrome P450 as exemplified by the simian cytochrome P450IIIA8 (SWISS-PROT Accession No. P33268). Table 12 indicates the comparison of the amino acid sequences between  
10 the human protein of the present invention (HP) and the simian cytochrome P450IIIA8 (CP). - represents a gap, \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present invention. The  
15 both proteins possessed a homology of 21.3% among the entire regions.

Table 12

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	HP	MLDFAIFAVTFLLALVGAVLYLYPASRQAAGIPGITPTEEKDGNLPDIVN-SGSLHEF
		...***...*****...*. . * . * . . . . *
5	CP	MDLIPDLAVETWLLAVTLVLLYLYGTHSHGLFKKLGIPTPLPLGNILSYRKGFWTF
	HP	LVLNHERYGPVVSFWFGRRLVVS�GTVDVLKQHINPNKTLDPFETMLK-SLLRYQSGGGS
		...** * . * . * . * . . . . * . . . * . . . . *
	CP	DMECYKKYGKVGWGFYDGRQPVLAITDPNMIK-TVLVKECYSVFTNRRPFGPVGFMKNAIS
	HP	VSEN----HMRKKLYENGVTDSLKSINFALLKLSEELLDKWLSYPET-QHVPLSQHMLGF
10		..* . . * . . . . . * . . * . . . * . . . * . . . *
	CP	IAEDEEWKRIRSLLSPTFTSGKLEMPVPIAKYGDVLVRNLRREAETGKPVTLKDVFGAY
	HP	AMKSVTQMVMG-----STF-EDDQEVIRFQKNHGTWSEIGKGFLDGSLD--KNM
		..* . * . * . . . . * . . . * . . . *
	CP	SMDVITSTSFVNIDSLNPNQDPFVENTKKLLRFDFLDPFSLITIFPFIPILEVNLIS
15	HP	TRKKQYEDALMQ-LESVLRNIIKE-RKGR-NFSQHIF-----IDSLVQGNLNDQQILED
		. . . . * . . . . . * . * . * . . . . * . . . *
	CP	IFPREVTSFLRKSVKRIKESRLKDTQKHRVDFLQLMIDSQNSKETESHKALSDELVAQS
	HP	MIFSLASCIITAKLCTWAICFLTTSSEEVQKKLYEEINQVF-GNGPVTPEKIEQLRYCQHV
		..* . . . * . . . * . * . * . * . * . * . * . *
20	CP	IIFIFAGYETTSSVLSFIIYELATHPDVQKLQEEIDTVLPNKAPPTYDTVLQMEYLDMV
	HP	LCETVRTAKLTPVSAQLQDIEGKIDRFIIPRETLVLYALGVVLQDPNTWSPHKFDPDRF
		. * . * . . . . . * . . . * . . . . * . * . * . *
	HP	VNETLRIFPIAMRLERVCKKDVEINGIFIPKGVVVMIPSYALHHDPKYWPEPEKFLPERF
	HP	----DDELVMKTFSSLGFSGTQECPELRFAYMVTTVLLSVLVKRLHLLSVEGQVIETKYE
25		..* . . . . * . * . . * . * . . . . * . *
	CP	SKKNNDNIDPYIYTPFG-SGPRNCIGMRFALNMKLAIIRVLQNFSFKPCKETQIPLKLR
	HP	LVTSSREEAWITVSKRY
		*
	CP	LGGLLQTEKPIVLKIESRDGTVSGA
30		

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Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs

possessing the homology of 90% or more (for example, Accession No. AA381169), but it can not be assessed whether these ESTs with partial sequences code for the same protein as the protein of the present invention.

5       The cytochrome P450 participates in the drug metabolism and can be utilized as a catalyst in organic synthesis reactions such as oxidation and so on.

      <HP10419> (Sequence Number 12, 30, 48)

      Determination of the whole base sequence for the cDNA  
10   insert of clone HP10419 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 170 bp, an ORF of 744 bp, and a 3'-non-translation region of 1116 bp. The ORF codes for a protein consisting of 247 amino acid residues with a hydrophobic region  
15   of putative seven transmembrane domains. Figure 13 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method.

      The search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing  
20   the homology of 90% or more (for example, Accession No. AA340663), but it can not be assessed whether these ESTs with partial sequences code for the same protein as the protein of the present invention.

      <HP10424> (Sequence Number 13, 31, 49)

25       Determination of the whole base sequence for the cDNA insert of clone HP10424 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 97 bp, an ORF of 342 bp, and a 3'-non-translation region of 54 bp. The ORF codes for a protein

consisting of 113 amino acid residues with one transmembrane domain at the N-terminal. Figure 14 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that the present protein remained in the membrane from the observation that the urokinase secretion was not identified upon transduction into the COS7 cells of an expression vector in which a HindIII-AccI fragment (after the Klenow treatment) containing a cDNA fragment encoding the N-terminal 58 amino acid residues in the present protein was inserted at the HindIII-SmaI site of pSSD3. The in vitro translation resulted in the formation of a translation product of 14 kDa that was somewhat larger than the molecular weight of 12,784 predicted from the ORF.

Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. AA401979), but it can not be assessed whether these ESTs with partial sequences code for the same protein as the protein of the present invention.

<HP10428> (Sequence Number 14, 32, 50)

Determination of the whole base sequence for the cDNA insert of clone HP10428 obtained from the human epidermoid carcinoma cell line KBc cDNA libraries revealed the structure consisting of a 5'-non-translation region of 287 bp, an ORF of 1098 bp, and a 3'-non-translation region of 659 bp. The ORF codes for a protein consisting of 365 amino acid residues with a hydrophobic region of putative nine transmembrane domains. Figure 15 depicts the hydrophobicity/hydrophilicity profile of

the present protein obtained by the Kyte-Doolittle method. The result of the in vitro translation did not reveal the formation of distinct bands and only revealed the formation of smeary bands at the high-molecular-weight position.

5       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was analogous to the baker's yeast hypothetical membrane protein YML038c (NBRF Accession No. S49741). Table 13 indicates the comparison of the amino acid sequences between the human  
10 protein of the present invention (HP) and the baker's yeast hypothetical membrane protein YML038c (SC). - represents a gap; \* represents an amino acid residue identical to that in the protein of the present invention, and . represents an amino acid residue analogous to that in the protein of the present  
15 invention. The both proteins possessed a homology of 26.3% among the N-terminal region of 281 amino acid residues.

Table 13

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	HP	MGRWALDVAFLWKAVLTGLVL-LYYCFSIGITFYNKWL-----TKSFHFPLFMTMLHLA
		...*... *...*...*...*... *...*...*
5	SC	MNRTVFLAFVFGWYFCS-IALSIYNRMFDPKDGLGIGYPVLVTTFHQA
	HP	VIFLFSALSRAVQ--CSSHRARVVLWADYLRRVAPTALALDVGLSNWSFLYVTVS
		...*...*... *... *... *... *... *... *... *
	SC	TLWLLSGIYIKLRHKPVKNVLRKNNGFNWSFFLKFLPTAVASAGDIGLSNVSFQYVPLT
	HP	LYTMTKSSAVLFILIFSLIFKLEEL--RAALVLVLLIAGGLFMF-----TYKSTQ-FN
10		...*...*... *...*... *...*... *... *... *... *
	SC	IYTIKSSSIAFVLLFGCIFKLEKFWKLALSVIIMFVGVALMVFKPSDSTSTKNDQALV
	HP	VEGFALVLGASFIGGIRWTLTQMLLQKAELGLQNPIDTMFHLQPLMFLGLFPLFAVFEGL
		. * *...*... *...*... *...*... *... *... *
	SC	IFGSFLVLASSCLSGLRWVYTQMLRNNPIQTNTAAVEES-DGALFTENEDNVDNEPVV
15	HP	HLSTSEKIFRFQDT-GLLLRVLGSLFLGGILAFGLGFSEFLLVSRTSSLTSLIAGIFKEV
		. *...*... *... *... *... *... *... *... *
	SC	NLANNKMLENFGESKPHPIHTIHQ--LAPIMGITLLLTSL-LLVEKPFPGIFS-SSIFRLD
	HP	CTLLLAHLLGDQISLLNWLGFALCLSGISLHVALKALHSRGDGGPKALKGLGSSPDLEL
20	SC	TSNGGVGTETTIVLSIVRGIVLLILPGFAVFLLTICEFSILEQTPVLTVSIVGIVKELLTV
	HP	LLRSSQREEGDNEEEYFVAQGQQ
	SC	IFGIIILSERLSGFYNWLGMLIIMADVCCYNYFRYKQDLLQKYHSVSTQDNRNELKGFQD

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25

Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. AA018345), but it can not be assessed whether these ESTs

with partial sequences code for the same protein as the protein of the present invention.

<HP10429> (Sequence Number 15, 33, 51)

Determination of the whole base sequence for the cDNA  
5 insert of clone HP10429 obtained from the human stomach cancer  
cDNA libraries revealed the structure consisting of a 5'-non-  
translation region of 156 bp, an ORF of 681 bp, and a 3'-non-  
translation region of 206 bp. The ORF codes for a protein  
consisting of 226 amino acid residues with four transmembrane  
10 domains. Figure 16 depicts the hydrophobicity/hydrophilicity  
profile of the present protein obtained by the Kyte-Doolittle  
method. The in vitro translation resulted in the formation of  
a translation product of 25 kDa that was almost consistent with  
the molecular weight of 25,321 predicted from the ORF.

15 The search of the protein data base using the amino acid  
sequence of the present protein revealed that the protein was  
not analogous to any known proteins. Furthermore, the search of  
GenBank using the base sequence of the present cDNA revealed  
that there existed some ESTs possessing the homology of 90% or  
20 more (for example, Accession No. AA315933), but it can not be  
assessed whether these ESTs with partial sequences code for the  
same protein as the protein of the present invention.

<HP10432> (Sequence Number 16, 34, 52)

Determination of the whole base sequence for the cDNA  
25 insert of clone HP10429 obtained from the human liver cDNA  
libraries revealed the structure consisting of a 5'-non-  
translation region of 28 bp, an ORF of 390 bp, and a 3'-non-  
translation region of 554 bp. The ORF codes for a protein  
consisting of 129 amino acid residues with a signal-like

sequence at the N-terminal and one interior transmembrane domain. Therefore, the present protein is considered to be a type-I membrane protein. Figure 17 depicts the hydrophobicity/hydrophilicity profile of the present protein  
5 obtained by the Kyte-Doolittle method.

The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was not analogous to any known proteins. Furthermore, the search of GenBank using the base sequence of the present cDNA revealed  
10 that there existed some ESTs possessing the homology of 90% or more (for example, Accession No. T74424), but the same ORF as that in the present cDNA was not identified.

<HP10433> (Sequence Number 17, 35, 53)

Determination of the whole base sequence for the cDNA  
15 insert of clone HP10433 obtained from the human liver cDNA libraries revealed the structure consisting of a 5'-non-translation region of 72 bp, an ORF of 492 bp, and a 3'-non-translation region of 131 bp. The ORF codes for a protein  
20 domain at the N-terminal. Figure 18 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. It was indicated that the present protein remained in the membrane from the observation that the urokinase secretion was not identified  
25 upon transduction into the COS7 cells of an expression vector in which a HindIII-Eco81I fragment (treated with the mung-bean nuclease) containing a cDNA fragment encoding the N-terminal 137 amino acid residues in the present protein was inserted at the HindIII-EcoRV site of pSSD3. Therefore, the present protein



is considered to be a type-II membrane protein. The in vitro translation resulted in the formation of a translation product of 21 kDa that was almost consistent with the molecular weight of 18,617 predicted from the ORF.

5       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was not analogous to any known proteins. Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or  
10 more (for example, Accession No. H84693), but many sequences are not distinct and the same ORF as that in the present cDNA was not identified.

<HP10480> (Sequence Number 18, 36, 54)

Determination of the whole base sequence for the cDNA  
15 insert of clone HP10480 obtained from the human stomach cancer cDNA libraries revealed the structure consisting of a 5'-non-translation region of 79 bp, an ORF of 582 bp, and a 3'-non-translation region of 1253 bp. The ORF codes for a protein consisting of 193 amino acid residues with four transmembrane  
20 domains. Figure 19 depicts the hydrophobicity/hydrophilicity profile of the present protein obtained by the Kyte-Doolittle method. The in vitro translation resulted in the formation of a translation product of 23 kDa that was somewhat larger than the molecular weight of 21,445 predicted from the ORF.

25       The search of the protein data base using the amino acid sequence of the present protein revealed that the protein was not analogous to any known proteins. Furthermore, the search of GenBank using the base sequence of the present cDNA revealed that there existed some ESTs possessing the homology of 90% or

more (for example, Accession No. W93606), but many sequences are not distinct and the same ORF as that in the present cDNA was not identified.

The present invention provides human proteins having  
5 transmembrane domains and cDNAs encoding said proteins. All of the proteins of the present invention are putative proteins controlling the proliferation and differentiation of the cells, because said proteins exist on the cell membrane. Therefore, the proteins of the present invention can be used as  
10 pharmaceuticals or as antigens for preparing antibodies against said proteins. Furthermore, said DNAs can be used for the expression of large amounts of said proteins. The cells expressing large amounts of membrane proteins with transfection of these membrane protein genes can be applied to the detection  
15 of the corresponding ligands, the screening of novel low-molecular medicines, and so on.

In addition to the activities and uses described above, the polynucleotides and proteins of the present invention may exhibit one or more of the uses or biological activities  
20 (including those associated with assays cited herein) identified below. Uses or activities described for proteins of the present invention may be provided by administration or use of such proteins or by administration or use of polynucleotides encoding such proteins (such as, for example, in gene therapies  
25 or vectors suitable for introduction of DNA).

#### Research Uses and Utilities

The polynucleotides provided by the present invention can be used by the research community for various purposes. The polynucleotides can be used to express recombinant protein for

analysis, characterization or therapeutic use; as markers for tissues in which the corresponding protein is preferentially expressed (either constitutively or at a particular stage of tissue differentiation or development or in disease states); as  
5 molecular weight markers on Southern gels; as chromosome markers or tags (when labeled) to identify chromosomes or to map related gene positions; to compare with endogenous DNA sequences in patients to identify potential genetic disorders; as probes to hybridize and thus discover novel, related DNA  
10 sequences; as a source of information to derive PCR primers for genetic fingerprinting; as a probe to "subtract-out" known sequences in the process of discovering other novel polynucleotides; for selecting and making oligomers for attachment to a "gene chip" or other support, including for  
15 examination of expression patterns; to raise anti-protein antibodies using DNA immunization techniques; and as an antigen to raise anti-DNA antibodies or elicit another immune response. Where the polynucleotide encodes a protein which binds or potentially binds to another protein (such as, for example, in  
20 a receptor-ligand interaction), the polynucleotide can also be used in interaction trap assays (such as, for example, that described in Gyuris et al., Cell 75:791-803 (1993)) to identify polynucleotides encoding the other protein with which binding occurs or to identify inhibitors of the binding interaction.

25 The proteins provided by the present invention can similarly be used in assay to determine biological activity, including in a panel of multiple proteins for high-throughput screening; to raise antibodies or to elicit another immune response; as a reagent (including the labeled reagent) in

assays designed to quantitatively determine levels of the protein (or its receptor) in biological fluids; as markers for tissues in which the corresponding protein is preferentially expressed (either constitutively or at a particular stage of  
5 tissue differentiation or development or in a disease state); and, of course, to isolate correlative receptors or ligands. Where the protein binds or potentially binds to another protein (such as, for example, in a receptor-ligand interaction), the protein can be used to identify the other protein with which  
10 binding occurs or to identify inhibitors of the binding interaction. Proteins involved in these binding interactions can also be used to screen for peptide or small molecule inhibitors or agonists of the binding interaction.

Any or all of these research utilities are capable of  
15 being developed into reagent grade or kit format for commercialization as research products.

Methods for performing the uses listed above are well known to those skilled in the art. References disclosing such methods include without limitation "Molecular Cloning: A  
20 Laboratory Manual", 2d ed., Cold Spring Harbor Laboratory Press, Sambrook, J., E.F. Fritsch and T. Maniatis eds., 1989, and "Methods in Enzymology: Guide to Molecular Cloning Techniques", Academic Press, Berger, S.L. and A.R. Kimmel eds., 1987.

#### 25     Nutritional Uses

Polynucleotides and proteins of the present invention can also be used as nutritional sources or supplements. Such uses include without limitation use as a protein or amino acid supplement, use as a carbon source, use as a nitrogen source

and use as a source of carbohydrate. In such cases the protein or polynucleotide of the invention can be added to the feed of a particular organism or can be administered as a separate solid or liquid preparation, such as in the form of powder, pills, solutions, suspensions or capsules. In the case of microorganisms, the protein or polynucleotide of the invention can be added to the medium in or on which the microorganism is cultured.

#### Cytokine and Cell Proliferation/Differentiation

##### 10 Activity

A protein of the present invention may exhibit cytokine, cell proliferation (either inducing or inhibiting) or cell differentiation (either inducing or inhibiting) activity or may induce production of other cytokines in certain cell populations. Many protein factors discovered to date, including all known cytokines, have exhibited activity in one or more factor dependent cell proliferation assays, and hence the assays serve as a convenient confirmation of cytokine activity. The activity of a protein of the present invention is evidenced by any one of a number of routine factor dependent cell proliferation assays for cell lines including, without limitation, 32D, DA2, DA1G, T10, B9, B9/11, BaF3, MC9/G, M+ (preB M+), 2E8, RB5, DA1, 123, T1165, HT2, CTLL2, TF-1, Mo7e and CMK.

25 The activity of a protein of the invention may, among other means, be measured by the following methods:

Assays for T-cell or thymocyte proliferation include without limitation those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H.

Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol. 137:3494-3500, 5 1986; Bertagnolli et al., J. Immunol. 145:1706-1712, 1990; Bertagnolli et al., Cellular Immunology 133:327-341, 1991; Bertagnolli, et al., J. Immunol. 149:3778-3783, 1992; Bowman et al., J. Immunol. 152: 1756-1761, 1994.

Assays for cytokine production and/or proliferation of 10 spleen cells, lymph node cells or thymocytes include, without limitation, those described in: Polyclonal T cell stimulation, Kruisbeek, A.M. and Shevach, E.M. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 3.12.1-3.12.14, John Wiley and Sons, Toronto. 1994; and Measurement of mouse 15 and human Interferon  $\gamma$ , Schreiber, R.D. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.8.1-6.8.8, John Wiley and Sons, Toronto. 1994.

Assays for proliferation and differentiation of 20 hematopoietic and lymphopoietic cells include, without limitation, those described in: Measurement of Human and Murine Interleukin 2 and Interleukin 4, Bottomly, K., Davis, L.S. and Lipsky, P.E. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.3.1-6.3.12, John Wiley and Sons, Toronto. 1991; deVries et al., J. Exp. Med. 173:1205-1211, 25 1991; Moreau et al., Nature 336:690-692, 1988; Greenberger et al., Proc. Natl. Acad. Sci. U.S.A. 80:2931-2938, 1983; Measurement of mouse and human interleukin 6 -Nordan, R. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.6.1-6.6.5, John Wiley and Sons, Toronto. 1991; Smith et

- al., Proc. Natl. Acad. Sci. U.S.A. 83:1857-1861, 1986; Measurement of human Interleukin 11 - Bennett, F., Giannotti, J., Clark, S.C. and Turner, K. J. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.15.1 John Wiley and Sons, Toronto. 1991; Measurement of mouse and human Interleukin 9 - Ciarletta, A., Giannotti, J., Clark, S.C. and Turner, K.J. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 6.13.1, John Wiley and Sons, Toronto. 1991.
- 10 Assays for T-cell clone responses to antigens (which will identify, among others, proteins that affect APC-T cell interactions as well as direct T-cell effects by measuring proliferation and cytokine production) include, without limitation, those described in: Current Protocols in
- 15 Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function; Chapter 6, Cytokines and their cellular receptors; Chapter 7, Immunologic studies in Humans);
- 20 Weinberger et al., Proc. Natl. Acad. Sci. USA 77:6091-6095, 1980; Weinberger et al., Eur. J. Immun. 11:405-411, 1981; Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988.

Immune Stimulating or Suppressing Activity

- 25 A protein of the present invention may also exhibit immune stimulating or immune suppressing activity, including without limitation the activities for which assays are described herein. A protein may be useful in the treatment of various immune deficiencies and disorders (including severe combined

immunodeficiency (SCID)), e.g., in regulating (up or down) growth and proliferation of T and/or B lymphocytes, as well as effecting the cytolytic activity of NK cells and other cell populations. These immune deficiencies may be genetic or be  
5 caused by viral (e.g., HIV) as well as bacterial or fungal infections, or may result from autoimmune disorders. More specifically, infectious diseases caused by viral, bacterial, fungal or other infection may be treatable using a protein of the present invention, including infections by HIV, hepatitis  
10 viruses, herpesviruses, mycobacteria, Leishmania spp., malaria spp. and various fungal infections such as candidiasis. Of course, in this regard, a protein of the present invention may also be useful where a boost to the immune system generally may be desirable, i.e., in the treatment of cancer.

15 Autoimmune disorders which may be treated using a protein of the present invention include, for example, connective tissue disease, multiple sclerosis, systemic lupus erythematosus, rheumatoid arthritis, autoimmune pulmonary inflammation, Guillain-Barre syndrome, autoimmune thyroiditis,  
20 insulin dependent diabetes mellitus, myasthenia gravis, graft-versus-host disease and autoimmune inflammatory eye disease. Such a protein of the present invention may also be useful in the treatment of allergic reactions and conditions, such as asthma (particularly allergic asthma) or  
25 other respiratory problems. Other conditions, in which immune suppression is desired (including, for example, organ transplantation), may also be treatable using a protein of the present invention.

Using the proteins of the invention it may also be



possible to immune responses, in a number of ways. Down regulation may be in the form of inhibiting or blocking an immune response already in progress or may involve preventing the induction of an immune response. The functions of activated T cells may be inhibited by suppressing T cell responses or by inducing specific tolerance in T cells, or both. Immunosuppression of T cell responses is generally an active, non-antigen-specific, process which requires continuous exposure of the T cells to the suppressive agent. Tolerance, which involves inducing non-responsiveness or anergy in T cells, is distinguishable from immunosuppression in that it is generally antigen-specific and persists after exposure to the tolerizing agent has ceased. Operationally, tolerance can be demonstrated by the lack of a T cell response upon reexposure to specific antigen in the absence of the tolerizing agent.

Down regulating or preventing one or more antigen functions (including without limitation B lymphocyte antigen functions (such as , for example, B7)), e.g., preventing high level lymphokine synthesis by activated T cells, will be useful in situations of tissue, skin and organ transplantation and in graft-versus-host disease (GVHD). For example, blockage of T cell function should result in reduced tissue destruction in tissue transplantation. Typically, in tissue transplants, rejection of the transplant is initiated through its recognition as foreign by T cells, followed by an immune reaction that destroys the transplant. The administration of a molecule which inhibits or blocks interaction of a B7 lymphocyte antigen with its natural ligand(s) on immune cells (such as a soluble, monomeric form of a peptide having B7-2

activity alone or in conjunction with a monomeric form of a peptide having an activity of another B lymphocyte antigen (e.g., B7-1, B7-3) or blocking antibody), prior to transplantation can lead to the binding of the molecule to the natural ligand(s) on the immune cells without transmitting the corresponding costimulatory signal. Blocking B lymphocyte antigen function in this matter prevents cytokine synthesis by immune cells, such as T cells, and thus acts as an immunosuppressant. Moreover, the lack of costimulation may also be sufficient to anergize the T cells, thereby inducing tolerance in a subject. Induction of long-term tolerance by B lymphocyte antigen-blocking reagents may avoid the necessity of repeated administration of these blocking reagents. To achieve sufficient immunosuppression or tolerance in a subject, it may also be necessary to block the function of a combination of B lymphocyte antigens.

The efficacy of particular blocking reagents in preventing organ transplant rejection or GVHD can be assessed using animal models that are predictive of efficacy in humans. Examples of appropriate systems which can be used include allogeneic cardiac grafts in rats and xenogeneic pancreatic islet cell grafts in mice, both of which have been used to examine the immunosuppressive effects of CTLA4Ig fusion proteins in vivo as described in Lenschow et al., *Science* 257:789-792 (1992) and Turka et al., *Proc. Natl. Acad. Sci USA*, 89:11102-11105 (1992). In addition, murine models of GVHD (see Paul ed., *Fundamental Immunology*, Raven Press, New York, 1989, pp. 846-847) can be used to determine the effect of blocking B lymphocyte antigen function in vivo on the development of that disease.

Blocking antigen function may also be therapeutically useful for treating autoimmune diseases. Many autoimmune disorders are the result of inappropriate activation of T cells that are reactive against self tissue and which promote the production of cytokines and autoantibodies involved in the pathology of the diseases. Preventing the activation of autoreactive T cells may reduce or eliminate disease symptoms. Administration of reagents which block costimulation of T cells by disrupting receptor:ligand interactions of B lymphocyte antigens can be used to inhibit T cell activation and prevent production of autoantibodies or T cell-derived cytokines which may be involved in the disease process. Additionally, blocking reagents may induce antigen-specific tolerance of autoreactive T cells which could lead to long-term relief from the disease.

The efficacy of blocking reagents in preventing or alleviating autoimmune disorders can be determined using a number of well-characterized animal models of human autoimmune diseases. Examples include murine experimental autoimmune encephalitis, systemic lupus erythmatosis in MRL/lpr/lpr mice or NZB hybrid mice, murine autoimmune collagen arthritis, diabetes mellitus in NOD mice and BB rats, and murine experimental myasthenia gravis (see Paul ed., Fundamental Immunology, Raven Press, New York, 1989, pp. 840-856).

Upregulation of an antigen function (preferably a B lymphocyte antigen function), as a means of up regulating immune responses, may also be useful in therapy. Upregulation of immune responses may be in the form of enhancing an existing immune response or eliciting an initial immune response. For example, enhancing an immune response through stimulating B

lymphocyte antigen function may be useful in cases of viral infection. In addition, systemic viral diseases such as influenza, the common cold, and encephalitis might be alleviated by the administration of stimulatory forms of B lymphocyte antigens systemically.

Alternatively, anti-viral immune responses may be enhanced in an infected patient by removing T cells from the patient, costimulating the T cells in vitro with viral antigen-pulsed APCs either expressing a peptide of the present invention or together with a stimulatory form of a soluble peptide of the present invention and reintroducing the in vitro activated T cells into the patient. Another method of enhancing anti-viral immune responses would be to isolate infected cells from a patient, transfect them with a nucleic acid encoding a protein of the present invention as described herein such that the cells express all or a portion of the protein on their surface, and reintroduce the transfected cells into the patient. The infected cells would now be capable of delivering a costimulatory signal to, and thereby activate, T cells in vivo.

In another application, up regulation or enhancement of antigen function (preferably B lymphocyte antigen function) may be useful in the induction of tumor immunity. Tumor cells (e.g., sarcoma, melanoma, lymphoma, leukemia, neuroblastoma, carcinoma) transfected with a nucleic acid encoding at least one peptide of the present invention can be administered to a subject to overcome tumor-specific tolerance in the subject. If desired, the tumor cell can be transfected to express a combination of peptides. For example, tumor cells obtained from a patient can be transfected ex vivo with an expression

vector directing the expression of a peptide having B7-2-like activity alone, or in conjunction with a peptide having B7-1-like activity and/or B7-3-like activity. The transfected tumor cells are returned to the patient to result in expression of the peptides on the surface of the transfected cell. Alternatively, gene therapy techniques can be used to target a tumor cell for transfection in vivo.

The presence of the peptide of the present invention having the activity of a B lymphocyte antigen(s) on the surface of the tumor cell provides the necessary costimulation signal to T cells to induce a T cell mediated immune response against the transfected tumor cells. In addition, tumor cells which lack MHC class I or MHC class II molecules, or which fail to reexpress sufficient amounts of MHC class I or MHC class II molecules, can be transfected with nucleic acid encoding all or a portion of (e.g., a cytoplasmic-domain truncated portion) of an MHC class I  $\alpha$  chain protein and  $\beta_2$  microglobulin protein or an MHC class II  $\alpha$  chain protein and an MHC class II  $\beta$  chain protein to thereby express MHC class I or MHC class II proteins on the cell surface. Expression of the appropriate class I or class II MHC in conjunction with a peptide having the activity of a B lymphocyte antigen (e.g., B7-1, B7-2, B7-3) induces a T cell mediated immune response against the transfected tumor cell. Optionally, a gene encoding an antisense construct which blocks expression of an MHC class II associated protein, such as the invariant chain, can also be cotransfected with a DNA encoding a peptide having the activity of a B lymphocyte antigen to promote presentation of tumor associated antigens and induce tumor specific immunity. Thus, the induction of a

T cell mediated immune response in a human subject may be sufficient to overcome tumor-specific tolerance in the subject.

The activity of a protein of the invention may, among other means, be measured by the following methods:

- 5        Suitable assays for thymocyte or splenocyte cytotoxicity include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays
- 10    for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Herrmann et al., Proc. Natl. Acad. Sci. USA 78:2488-2492, 1981; Herrmann et al., J. Immunol. 128:1968-1974, 1982; Handa et al., J. Immunol. 135:1564-1572, 1985; Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol.
- 15    140:508-512, 1988; Herrmann et al., Proc. Natl. Acad. Sci. USA 78:2488-2492, 1981; Herrmann et al., J. Immunol. 128:1968-1974, 1982; Handa et al., J. Immunol. 135:1564-1572, 1985; Takai et al., J. Immunol. 137:3494-3500, 1986; Bowman et al., J. Virology 61:1992-1998; Takai et al., J. Immunol. 140:508-512, 1988;
- 20    Bertagnolli et al., Cellular Immunology 133:327-341, 1991; Brown et al., J. Immunol. 153:3079-3092, 1994.

Assays for T-cell-dependent immunoglobulin responses and isotype switching (which will identify, among others, proteins that modulate T-cell dependent antibody responses and that

25    affect Th1/Th2 profiles) include, without limitation, those described in: Maliszewski, J. Immunol. 144:3028-3033, 1990; and Assays for B cell function: In vitro antibody production, Mond, J.J. and Brunswick, M. In Current Protocols in Immunology. J.E.e.a. Coligan eds. Vol 1 pp. 3.8.1-3.8.16, John

Wiley and Sons, Toronto. 1994.

Mixed lymphocyte reaction (MLR) assays (which will identify, among others, proteins that generate predominantly Th1 and CTL responses) include, without limitation, those described in: Current Protocols in Immunology, Ed by J. E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 3, In Vitro assays for Mouse Lymphocyte Function 3.1-3.19; Chapter 7, Immunologic studies in Humans); Takai et al., J. Immunol. 137:3494-3500, 1986; Takai et al., J. Immunol. 140:508-512, 1988; Bertagnolli et al., J. Immunol. 149:3778-3783, 1992.

Dendritic cell-dependent assays (which will identify, among others, proteins expressed by dendritic cells that activate naive T-cells) include, without limitation, those described in: Guery et al., J. Immunol. 134:536-544, 1995; Inaba et al., Journal of Experimental Medicine 173:549-559, 1991; Macatonia et al., Journal of Immunology 154:5071-5079, 1995; Porgador et al., Journal of Experimental Medicine 182:255-260, 1995; Nair et al., Journal of Virology 67:4062-4069, 1993; Huang et al., Science 264:961-965, 1994; Macatonia et al., Journal of Experimental Medicine 169:1255-1264, 1989; Bhardwaj et al., Journal of Clinical Investigation 94:797-807, 1994; and Inaba et al., Journal of Experimental Medicine 172:631-640, 1990.

Assays for lymphocyte survival/apoptosis (which will identify, among others, proteins that prevent apoptosis after superantigen induction and proteins that regulate lymphocyte homeostasis) include, without limitation, those described in:

Darzynkiewicz et al., Cytometry 13:795-808, 1992; Gorczyca et al., Leukemia 7:659-670, 1993; Gorczyca et al., Cancer Research 53:1945-1951, 1993; Itoh et al., Cell 66:233-243, 1991; Zacharchuk, Journal of Immunology 145:4037-4045, 1990; Zamai et al., Cytometry 14:891-897, 1993; Gorczyca et al., International Journal of Oncology 1:639-648, 1992.

Assays for proteins that influence early steps of T-cell commitment and development include, without limitation, those described in: Antica et al., Blood 84:111-117, 1994; Fine et al., Cellular Immunology 155:111-122, 1994; Galy et al., Blood 85:2770-2778, 1995; Toki et al., Proc. Nat. Acad Sci. USA 88:7548-7551, 1991.

#### Hematopoiesis Regulating Activity

A protein of the present invention may be useful in regulation of hematopoiesis and, consequently, in the treatment of myeloid or lymphoid cell deficiencies. Even marginal biological activity in support of colony forming cells or of factor-dependent cell lines indicates involvement in regulating hematopoiesis, e.g. in supporting the growth and proliferation of erythroid progenitor cells alone or in combination with other cytokines, thereby indicating utility, for example, in treating various anemias or for use in conjunction with irradiation/chemotherapy to stimulate the production of erythroid precursors and/or erythroid cells; in supporting the growth and proliferation of myeloid cells such as granulocytes and monocytes/macrophages (i.e., traditional CSF activity) useful, for example, in conjunction with chemotherapy to prevent or treat consequent myelo-suppression; in supporting the growth and proliferation of megakaryocytes and consequently



of platelets thereby allowing prevention or treatment of various platelet disorders such as thrombocytopenia, and generally for use in place of or complimentary to platelet transfusions; and/or in supporting the growth and proliferation of hematopoietic stem cells which are capable of maturing to any and all of the above-mentioned hematopoietic cells and therefore find therapeutic utility in various stem cell disorders (such as those usually treated with transplantation, including, without limitation, aplastic anemia and paroxysmal nocturnal hemoglobinuria), as well as in repopulating the stem cell compartment post irradiation/chemotherapy, either in-vivo or ex-vivo (i.e., in conjunction with bone marrow transplantation or with peripheral progenitor cell transplantation (homologous or heterologous)) as normal cells or genetically manipulated for gene therapy.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Suitable assays for proliferation and differentiation of various hematopoietic lines are cited above.

Assays for embryonic stem cell differentiation (which will identify, among others, proteins that influence embryonic differentiation hematopoiesis) include, without limitation, those described in: Johansson et al. Cellular Biology 15:141-151, 1995; Keller et al., Molecular and Cellular Biology 13:473-486, 1993; McClanahan et al., Blood 81:2903-2915, 1993.

Assays for stem cell survival and differentiation (which will identify, among others, proteins that regulate lympho-hematopoiesis) include, without limitation, those described in: Methylcellulose colony forming assays, Freshney,

M.G. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 265-268, Wiley-Liss, Inc., New York, NY. 1994; Hirayama et al., Proc. Natl. Acad. Sci. USA 89:5907-5911, 1992; Primitive hematopoietic colony forming cells with high proliferative potential, McNiece, I.K. and Briddell, R.A. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 23-39, Wiley-Liss, Inc., New York, NY. 1994; Neben et al., Experimental Hematology 22:353-359, 1994; Cobblestone area forming cell assay, Ploemacher, R.E. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 1-21, Wiley-Liss, Inc., New York, NY. 1994; Long term bone marrow cultures in the presence of stromal cells, Spooncer, E., Dexter, M. and Allen, T. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 163-179, Wiley-Liss, Inc., New York, NY. 1994; Long term culture initiating cell assay, Sutherland, H.J. In Culture of Hematopoietic Cells. R.I. Freshney, et al. eds. Vol pp. 139-162, Wiley-Liss, Inc., New York, NY. 1994.

#### Tissue Growth Activity

20 A protein of the present invention also may have utility in compositions used for bone, cartilage, tendon, ligament and/or nerve tissue growth or regeneration, as well as for wound healing and tissue repair and replacement, and in the treatment of burns, incisions and ulcers.

25 A protein of the present invention, which induces cartilage and/or bone growth in circumstances where bone is not normally formed, has application in the healing of bone fractures and cartilage damage or defects in humans and other animals. Such a preparation employing a protein of the

invention may have prophylactic use in closed as well as open fracture reduction and also in the improved fixation of artificial joints. De novo bone formation induced by an osteogenic agent contributes to the repair of congenital, 5 trauma induced, or oncologic resection induced craniofacial defects, and also is useful in cosmetic plastic surgery.

A protein of this invention may also be used in the treatment of periodontal disease, and in other tooth repair processes. Such agents may provide an environment to attract 10 bone-forming cells, stimulate growth of bone-forming cells or induce differentiation of progenitors of bone-forming cells. A protein of the invention may also be useful in the treatment of osteoporosis or osteoarthritis, such as through stimulation of bone and/or cartilage repair or by blocking inflammation or 15 processes of tissue destruction (collagenase activity, osteoclast activity, etc.) mediated by inflammatory processes.

Another category of tissue regeneration activity that may be attributable to the protein of the present invention is tendon/ligament formation. A protein of the present invention, 20 which induces tendon/ligament-like tissue or other tissue formation in circumstances where such tissue is not normally formed, has application in the healing of tendon or ligament tears, deformities and other tendon or ligament defects in humans and other animals. Such a preparation employing a 25 tendon/ligament-like tissue inducing protein may have prophylactic use in preventing damage to tendon or ligament tissue, as well as use in the improved fixation of tendon or ligament to bone or other tissues, and in repairing defects to tendon or ligament tissue. De novo tendon/ligament-like tissue

formation induced by a composition of the present invention contributes to the repair of congenital, trauma induced, or other tendon or ligament defects of other origin, and is also useful in cosmetic plastic surgery for attachment or repair of  
5 tendons or ligaments. The compositions of the present invention may provide an environment to attract tendon- or ligament-forming cells, stimulate growth of tendon- or ligament-forming cells, induce differentiation of progenitors of tendon- or ligament-forming cells, or induce growth of  
10 tendon/ligament cells or progenitors ex vivo for return in vivo to effect tissue repair. The compositions of the invention may also be useful in the treatment of tendinitis, carpal tunnel syndrome and other tendon or ligament defects. The compositions may also include an appropriate matrix and/or  
15 sequestering agent as a carrier as is well known in the art.

The protein of the present invention may also be useful for proliferation of neural cells and for regeneration of nerve and brain tissue, i.e. for the treatment of central and peripheral nervous system diseases and neuropathies, as well as  
20 mechanical and traumatic disorders, which involve degeneration, death or trauma to neural cells or nerve tissue. More specifically, a protein may be used in the treatment of diseases of the peripheral nervous system, such as peripheral nerve injuries, peripheral neuropathy and localized  
25 neuropathies, and central nervous system diseases, such as Alzheimer's, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, and Shy-Drager syndrome. Further conditions which may be treated in accordance with the present invention include mechanical and traumatic disorders,

such as spinal cord disorders, head trauma and cerebrovascular diseases such as stroke. Peripheral neuropathies resulting from chemotherapy or other medical therapies may also be treatable using a protein of the invention.

5 Proteins of the invention may also be useful to promote better or faster closure of non-healing wounds, including without limitation pressure ulcers, ulcers associated with vascular insufficiency, surgical and traumatic wounds, and the like.

10 It is expected that a protein of the present invention may also exhibit activity for generation or regeneration of other tissues, such as organs (including, for example, pancreas, liver, intestine, kidney, skin, endothelium), muscle (smooth, skeletal or cardiac) and vascular (including vascular  
15 endothelium) tissue, or for promoting the growth of cells comprising such tissues. Part of the desired effects may be by inhibition or modulation of fibrotic scarring to allow normal tissue to regenerate. A protein of the invention may also exhibit angiogenic activity.

20 A protein of the present invention may also be useful for gut protection or regeneration and treatment of lung or liver fibrosis, reperfusion injury in various tissues, and conditions resulting from systemic cytokine damage.

A protein of the present invention may also be useful for  
25 promoting or inhibiting differentiation of tissues described above from precursor tissues or cells; or for inhibiting the growth of tissues described above.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Assays for tissue generation activity include, without limitation, those described in: International Patent Publication No. WO95/16035 (bone, cartilage, tendon); International Patent Publication No. WO95/05846 (nerve, neuronal); International Patent Publication No. WO91/07491 (skin, endothelium ).

Assays for wound healing activity include, without limitation, those described in: Winter, Epidermal Wound Healing, pps. 71-112 (Maibach, HI and Rovee, DT, eds.), Year Book Medical Publishers, Inc., Chicago, as modified by Eaglstein and Mertz, J. Invest. Dermatol 71:382-84 (1978).

#### Activin/Inhibin Activity

A protein of the present invention may also exhibit activin- or inhibin-related activities. Inhibins are characterized by their ability to inhibit the release of follicle stimulating hormone (FSH), while activins and are characterized by their ability to stimulate the release of follicle stimulating hormone (FSH). Thus, a protein of the present invention, alone or in heterodimers with a member of the inhibin  $\alpha$  family, may be useful as a contraceptive based on the ability of inhibins to decrease fertility in female mammals and decrease spermatogenesis in male mammals. Administration of sufficient amounts of other inhibins can induce infertility in these mammals. Alternatively, the protein of the invention, as a homodimer or as a heterodimer with other protein subunits of the inhibin- $\beta$  group, may be useful as a fertility inducing therapeutic, based upon the ability of activin molecules in stimulating FSH release from cells of the anterior pituitary. See, for example, United States Patent 4,798,885. A protein of

the invention may also be useful for advancement of the onset of fertility in sexually immature mammals, so as to increase the lifetime reproductive performance of domestic animals such as cows, sheep and pigs.

5       The activity of a protein of the invention may, among other means, be measured by the following methods:

Assays for activin/inhibin activity include, without limitation, those described in: Vale et al., Endocrinology 91:562-572, 1972; Ling et al., Nature 321:779-782, 1986; Vale  
10 et al., Nature 321:776-779, 1986; Mason et al., Nature 318:659-663, 1985; Forage et al., Proc. Natl. Acad. Sci. USA 83:3091-3095, 1986.

#### Chemotactic/Chemokinetic Activity

A protein of the present invention may have chemotactic or  
15 chemokinetic activity (e.g., act as a chemokine) for mammalian cells, including, for example, monocytes, fibroblasts, neutrophils, T-cells, mast cells, eosinophils, epithelial and/or endothelial cells. Chemotactic and chemokinetic proteins can be used to mobilize or attract a desired cell  
20 population to a desired site of action. Chemotactic or chemokinetic proteins provide particular advantages in treatment of wounds and other trauma to tissues, as well as in treatment of localized infections. For example, attraction of lymphocytes, monocytes or neutrophils to tumors or sites of  
25 infection may result in improved immune responses against the tumor or infecting agent.

A protein or peptide has chemotactic activity for a particular cell population if it can stimulate, directly or indirectly, the directed orientation or movement of such cell

population. Preferably, the protein or peptide has the ability to directly stimulate directed movement of cells. Whether a particular protein has chemotactic activity for a population of cells can be readily determined by employing such protein or peptide in any known assay for cell chemotaxis.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Assays for chemotactic activity (which will identify proteins that induce or prevent chemotaxis) consist of assays that measure the ability of a protein to induce the migration of cells across a membrane as well as the ability of a protein to induce the adhesion of one cell population to another cell population. Suitable assays for movement and adhesion include, without limitation, those described in: Current Protocols in Immunology, Ed by J.E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W. Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 6.12, Measurement of alpha and beta Chemokines 6.12.1-6.12.28; Taub et al. J. Clin. Invest. 95:1370-1376, 1995; Lind et al. APMIS 103:140-146, 1995; Muller et al Eur. J. Immunol. 25: 1744-1748; Gruber et al. J. of Immunol. 152:5860-5867, 1994; Johnston et al. J. of Immunol. 153: 1762-1768, 1994.

#### Hemostatic and Thrombolytic Activity

A protein of the invention may also exhibit hemostatic or thrombolytic activity. As a result, such a protein is expected to be useful in treatment of various coagulation disorders (including hereditary disorders, such as hemophilias) or to enhance coagulation and other hemostatic events in treating wounds resulting from trauma, surgery or other causes. A



protein of the invention may also be useful for dissolving or inhibiting formation of thromboses and for treatment and prevention of conditions resulting therefrom (such as, for example, infarction of cardiac and central nervous system vessels (e.g., stroke).

The activity of a protein of the invention may, among other means, be measured by the following methods:

Assay for hemostatic and thrombolytic activity include, without limitation, those described in: Linet et al., J. Clin. Pharmacol. 26:131-140, 1986; Burdick et al., Thrombosis Res. 45:413-419, 1987; Humphrey et al., Fibrinolysis 5:71-79 (1991); Schaub, Prostaglandins 35:467-474, 1988.

#### Receptor/Ligand Activity

A protein of the present invention may also demonstrate activity as receptors, receptor ligands or inhibitors or agonists of receptor/ligand interactions. Examples of such receptors and ligands include, without limitation, cytokine receptors and their ligands, receptor kinases and their ligands, receptor phosphatases and their ligands, receptors involved in cell-cell interactions and their ligands (including without limitation, cellular adhesion molecules (such as selectins, integrins and their ligands) and receptor/ligand pairs involved in antigen presentation, antigen recognition and development of cellular and humoral immune responses).

Receptors and ligands are also useful for screening of potential peptide or small molecule inhibitors of the relevant receptor/ligand interaction. A protein of the present invention (including, without limitation, fragments of receptors and ligands) may themselves be useful as inhibitors

of receptor/ligand interactions.

The activity of a protein of the invention may, among other means, be measured by the following methods:

Suitable assays for receptor-ligand activity include  
5 without limitation those described in: Current Protocols in Immunology, Ed by J.E. Coligan, A.M. Kruisbeek, D.H. Margulies, E.M. Shevach, W. Strober, Pub. Greene Publishing Associates and Wiley-Interscience (Chapter 7.28, Measurement of Cellular Adhesion under static conditions 7.28.1-7.28.22), Takai et al.,  
10 Proc. Natl. Acad. Sci. USA 84:6864-6868, 1987; Bierer et al., J. Exp. Med. 168:1145-1156, 1988; Rosenstein et al., J. Exp. Med. 169:149-160 1989; Stoltenborg et al., J. Immunol. Methods 175:59-68, 1994; Stitt et al., Cell 80:661-670, 1995.

#### Anti-Inflammatory Activity

15 Proteins of the present invention may also exhibit anti-inflammatory activity. The anti-inflammatory activity may be achieved by providing a stimulus to cells involved in the inflammatory response, by inhibiting or promoting cell-cell interactions (such as, for example, cell adhesion), by  
20 inhibiting or promoting chemotaxis of cells involved in the inflammatory process, inhibiting or promoting cell extravasation, or by stimulating or suppressing production of other factors which more directly inhibit or promote an inflammatory response. Proteins exhibiting such activities can  
25 be used to treat inflammatory conditions including chronic or acute conditions), including without limitation inflammation associated with infection (such as septic shock, sepsis or systemic inflammatory response syndrome (SIRS)), ischemia-reperfusion injury, endotoxin lethality, arthritis,

complement-mediated hyperacute rejection, nephritis, cytokine or chemokine-induced lung injury, inflammatory bowel disease, Crohn's disease or resulting from over production of cytokines such as TNF or IL-1. Proteins of the invention may also be  
5 useful to treat anaphylaxis and hypersensitivity to an antigenic substance or material.

#### Tumor Inhibition Activity

In addition to the activities described above for immunological treatment or prevention of tumors, a protein of  
10 the invention may exhibit other anti-tumor activities. A protein may inhibit tumor growth directly or indirectly (such as, for example, via ADCC). A protein may exhibit its tumor inhibitory activity by acting on tumor tissue or tumor precursor tissue, by inhibiting formation of tissues necessary  
15 to support tumor growth (such as, for example, by inhibiting angiogenesis), by causing production of other factors, agents or cell types which inhibit tumor growth, or by suppressing, eliminating or inhibiting factors, agents or cell types which promote tumor growth

#### 20 Other Activities

A protein of the invention may also exhibit one or more of the following additional activities or effects: inhibiting the growth, infection or function of, or killing, infectious agents, including, without limitation, bacteria, viruses, fungi  
25 and other parasites; effecting (suppressing or enhancing) bodily characteristics, including, without limitation, height, weight, hair color, eye color, skin, fat to lean ratio or other tissue pigmentation, or organ or body part size or shape (such as, for example, breast augmentation or diminution, change in

bone form or shape); effecting biorhythms or circadian cycles or rhythms; effecting the fertility of male or female subjects; effecting the metabolism, catabolism, anabolism, processing, utilization, storage or elimination of dietary fat, lipid, protein, carbohydrate, vitamins, minerals, cofactors or other nutritional factors or component(s); effecting behavioral characteristics, including, without limitation, appetite, libido, stress, cognition (including cognitive disorders), depression (including depressive disorders) and violent behaviors; providing analgesic effects or other pain reducing effects; promoting differentiation and growth of embryonic stem cells in lineages other than hematopoietic lineages; hormonal or endocrine activity; in the case of enzymes, correcting deficiencies of the enzyme and treating deficiency-related diseases; treatment of hyperproliferative disorders (such as, for example, psoriasis); immunoglobulin-like activity (such as, for example, the ability to bind antigens or complement); and the ability to act as an antigen in a vaccine composition to raise an immune response against such protein or another material or entity which is cross-reactive with such protein.

## Sequence Table

(2) INFORMATION FOR SEQ ID NO: 1:

5 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 382

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

10 (iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Liver

15 (D) CLONE NAME: HP01263

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Met	Gly	Leu	Leu	Leu	Pro	Leu	Ala	Leu	Cys	Ile	Leu	Val	Leu	Cys	Cys
20	1			5					10					15	
Gly	Ala	Met	Ser	Pro	Pro	Gln	Leu	Ala	Leu	Asn	Pro	Ser	Ala	Leu	Leu
				20				25					30		
Ser	Arg	Gly	Cys	Asn	Asp	Ser	Asp	Val	Leu	Ala	Val	Ala	Gly	Phe	Ala
				35			40					45			
25	Leu	Arg	Asp	Ile	Asn	Lys	Asp	Arg	Lys	Asp	Gly	Tyr	Val	Leu	Arg
		50				55					60				
Asn	Arg	Val	Asn	Asp	Ala	Gln	Glu	Tyr	Arg	Arg	Gly	Gly	Leu	Gly	Ser
	65				70				75				80		
Leu	Phe	Tyr	Leu	Thr	Leu	Asp	Val	Leu	Glu	Thr	Asp	Cys	His	Val	Leu
30				85				90					95		
Arg	Lys	Lys	Ala	Trp	Gln	Asp	Cys	Gly	Met	Arg	Ile	Phe	Phe	Glu	Ser
			100				105					110			
Val	Tyr	Gly	Gln	Cys	Lys	Ala	Ile	Phe	Tyr	Met	Asn	Asn	Pro	Ser	Arg
	115					120					125				
35	Val	Leu	Tyr	Leu	Ala	Ala	Tyr	Asn	Cys	Thr	Leu	Arg	Pro	Val	Ser
		130				135					140				
Lys	Lys	Ile	Tyr	Met	Thr	Cys	Pro	Asp	Cys	Pro	Ser	Ser	Ile	Pro	Thr
145					150				155				160		

84

Asp Ser Ser Asn His Gln Val Leu Glu Ala Ala Thr Glu Ser Leu Ala  
                   165                  170                  175  
 Lys Tyr Asn Asn Glu Asn Thr Ser Lys Gln Tyr Ser Leu Phe Lys Val  
                   180                  185                  190  
 5 Thr Arg Ala Ser Ser Gln Trp Val Val Gly Pro Ser Tyr Phe Val Glu  
                   195                  200                  205  
 Tyr Leu Ile Lys Glu Ser Pro Cys Thr Lys Ser Gln Ala Ser Ser Cys  
                   210                  215                  220  
 Ser Leu Gln Ser Ser Asp Ser Val Pro Val Gly Leu Cys Lys Gly Ser  
 10 225                  230                  235                  240  
 Leu Thr Arg Thr His Trp Glu Lys Phe Val Ser Val Thr Cys Asp Phe  
                   245                  250                  255  
 Phe Glu Ser Gln Ala Pro Ala Thr Gly Ser Glu Asn Ser Ala Val Asn  
                   260                  265                  270  
 15 Gln Lys Pro Thr Asn Leu Pro Lys Val Glu Glu Ser Gln Gln Lys Asn  
                   275                  280                  285  
 Thr Pro Pro Thr Asp Ser Pro Ser Lys Ala Gly Pro Arg Gly Ser Val  
                   290                  295                  300  
 Gln Tyr Leu Pro Asp Leu Asp Asp Lys Asn Ser Gln Glu Lys Gly Pro  
 20 305                  310                  315                  320  
 Gln Glu Ala Phe Pro Val His Leu Asp Leu Thr Thr Asn Pro Gln Gly  
                   325                  330                  335  
 Glu Thr Leu Asp Ile Ser Phe Leu Phe Leu Glu Pro Met Glu Glu Lys  
                   340                  345                  350  
 25 Leu Val Val Leu Pro Phe Pro Lys Glu Lys Ala Arg Thr Ala Glu Cys  
                   355                  360                  365  
 Pro Gly Pro Ala Gln Asn Ala Ser Pro Leu Val Leu Pro Pro  
                   370                  375                  380

30

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 317

(B) TYPE: Amino acid

35

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Liver

(D) CLONE NAME: HP01299

5

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

```

Met Trp Leu Tyr Leu Ala Ala Phe Val Gly Leu Tyr Tyr Leu Leu His
  1             5             10             15
10 Trp Tyr Arg Glu Arg Gln Val Val Ser His Leu Gln Asp Lys Tyr Val
    20             25             30
Phe Ile Thr Gly Cys Asp Ser Gly Phe Gly Asn Leu Leu Ala Arg Gln
    35             40             45
Leu Asp Ala Arg Gly Leu Arg Val Leu Ala Ala Cys Leu Thr Glu Lys
15    50             55             60
Gly Ala Glu Gln Leu Arg Gly Gln Thr Ser Asp Arg Leu Glu Thr Val
    65             70             75             80
Thr Leu Asp Val Thr Lys Met Glu Ser Ile Ala Ala Ala Thr Gln Trp
    85             90             95
20 Val Lys Glu His Val Gly Asp Arg Gly Leu Trp Gly Leu Val Asn Asn
    100            105            110
Ala Gly Ile Leu Thr Pro Ile Thr Leu Cys Glu Trp Leu Asn Thr Glu
    115            120            125
Asp Ser Met Asn Met Leu Lys Val Asn Leu Ile Gly Val Ile Gln Val
25    130            135            140
Thr Leu Ser Met Leu Pro Leu Val Arg Arg Ala Arg Gly Arg Ile Val
    145            150            155            160
Asn Val Ser Ser Ile Leu Gly Arg Val Ala Phe Phe Val Gly Gly Tyr
    165            170            175
30 Cys Val Ser Lys Tyr Gly Val Glu Ala Phe Ser Asp Ile Leu Arg Arg
    180            185            190
Glu Ile Gln His Phe Gly Val Lys Ile Ser Ile Val Glu Pro Gly Tyr
    195            200            205
Phe Arg Thr Gly Met Thr Asn Met Thr Gln Ser Leu Glu Arg Met Lys
35    210            215            220
Gln Ser Trp Lys Glu Ala Pro Lys His Ile Lys Glu Thr Tyr Gly Gln
    225            230            235            240
Gln Tyr Phe Asp Ala Leu Tyr Asn Ile Met Lys Glu Gly Leu Leu Asn

```

86

					245				250					255		
	Cys	Ser	Thr	Asn	Leu	Asn	Leu	Val	Thr	Asp	Cys	Met	Glu	His	Ala	Leu
				260					265					270		
	Thr	Ser	Val	His	Pro	Arg	Thr	Arg	Tyr	Ser	Ala	Gly	Trp	Asp	Ala	Lys
5			275					280					285			
	Phe	Phe	Phe	Ile	Pro	Leu	Ser	Tyr	Leu	Pro	Thr	Ser	Leu	Ala	Asp	Tyr
			290					295					300			
	Ile	Leu	Thr	Arg	Ser	Trp	Pro	Lys	Pro	Ala	Gln	Ala	Val			
	305					310							315			

(2) INFORMATION FOR SEQ ID NO: 3:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 296

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Liver

(D) CLONE NAME: HP01347

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

```

Met Ser Asp Ser Lys Glu Pro Arg Val Gln Gln Leu Gly Leu Leu Gly
  1                      5                      10                      15
Cys Leu Gly His Gly Ala Leu Val Leu Gln Leu Leu Ser Phe Met Leu
30                      20                      25                      30
Leu Ala Gly Val Leu Val Ala Ile Leu Val Gln Val Ser Lys Val Pro
                      35                      40                      45
Ser Ser Leu Ser Gln Glu Gln Ser Glu Gln Asp Ala Ile Tyr Gln Asn
                      50                      55                      60
35 Leu Thr Gln Leu Lys Ala Ala Val Gly Glu Leu Ser Glu Lys Ser Lys
  65                      70                      75                      80
Leu Gln Glu Ile Tyr Gln Glu Leu Thr Gln Leu Lys Ala Ala Val Gly
                      85                      90                      95

```



87

Glu Leu Pro Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr  
                   100                  105                  110  
 Arg Leu Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln  
                   115                  120                  125  
 5 Glu Ile Tyr Gln Glu Leu Thr Arg Leu Lys Ala Ala Val Gly Glu Leu  
                   130                  135                  140  
 Pro Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr Arg Leu  
                   145                  150                  155                  160  
 Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln Glu Ile  
 10                                   165                  170                  175  
 Tyr Gln Glu Leu Thr Glu Leu Lys Ala Ala Val Gly Glu Leu Pro Glu  
                   180                  185                  190  
 Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr Gln Leu Lys Ala  
                   195                  200                  205  
 15 Ala Val Gly Glu Leu Pro Asp Gln Ser Lys Gln Gln Gln Ile Tyr Gln  
                   210                  215                  220  
 Glu Leu Thr Asp Leu Lys Thr Ala Phe Glu Arg Leu Cys Arg His Cys  
                   225                  230                  235                  240  
 Pro Lys Asp Trp Thr Phe Phe Gln Gly Asn Cys Tyr Phe Met Ser Asn  
 20                                   245                  250                  255  
 Ser Gln Arg Asn Trp His Asp Ser Val Thr Ala Cys Gln Glu Val Arg  
                   260                  265                  270  
 Ala Gln Leu Val Val Ile Lys Thr Ala Glu Glu Gln Leu Pro Ala Val  
                   275                  280                  285  
 25 Leu Glu Gln Trp Arg Thr Gln Gln  
                   290                  295

## (2) INFORMATION FOR SEQ ID NO: 4:

## 30 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 197

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

## 35 (iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

88

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP01440

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

5  
 Met Cys Thr Gly Lys Cys Ala Arg Cys Val Gly Leu Ser Leu Ile Thr  
 1 5 10 15  
 Leu Cys Leu Val Cys Ile Val Ala Asn Ala Leu Leu Leu Val Pro Asn  
 20 25 30  
 10 Gly Glu Thr Ser Trp Thr Asn Thr Asn His Leu Ser Leu Gln Val Trp  
 35 40 45  
 Leu Met Gly Gly Phe Ile Gly Gly Gly Leu Met Val Leu Cys Pro Gly  
 50 55 60  
 Ile Ala Ala Val Arg Ala Gly Gly Lys Gly Cys Cys Gly Ala Gly Cys  
 15 65 70 75 80  
 Cys Gly Asn Arg Cys Arg Met Leu Arg Ser Val Phe Ser Ser Ala Phe  
 85 90 95  
 Gly Val Leu Gly Ala Ile Tyr Cys Leu Ser Val Ser Gly Ala Gly Leu  
 100 105 110  
 20 Arg Asn Gly Pro Arg Cys Leu Met Asn Gly Glu Trp Gly Tyr His Phe  
 115 120 125  
 Glu Asp Thr Ala Gly Ala Tyr Leu Leu Asn Arg Thr Leu Trp Asp Arg  
 130 135 140  
 Cys Glu Ala Pro Pro Arg Val Val Pro Trp Asn Val Thr Leu Phe Ser  
 25 145 150 155 160  
 Leu Leu Val Ala Ala Ser Cys Leu Glu Ile Val Leu Cys Gly Ile Gln  
 165 170 175  
 Leu Val Asn Ala Thr Ile Gly Val Phe Cys Gly Asp Cys Arg Lys Lys  
 180 185 190  
 30 Gln Asp Thr Pro His  
 195

(2) INFORMATION FOR SEQ ID NO: 5:

(i) SEQUENCE CHARACTERISTICS:

35

(A) LENGTH: 221

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 5 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP01526

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

```

10 Met Glu Ala Gly Gly Phe Leu Asp Ser Leu Ile Tyr Gly Ala Cys Val
    1           5           10           15
Val Phe Thr Leu Gly Met Phe Ser Ala Gly Leu Ser Asp Leu Arg His
    20           25           30
Met Arg Met Thr Arg Ser Val Asp Asn Val Gln Phe Leu Pro Phe Leu
15      35           40           45
Thr Thr Glu Val Asn Asn Leu Gly Trp Leu Ser Tyr Gly Ala Leu Lys
    50           55           60
Gly Asp Gly Ile Leu Ile Val Val Asn Thr Val Gly Ala Ala Leu Gln
    65           70           75           80
20 Thr Leu Tyr Ile Leu Ala Tyr Leu His Tyr Cys Pro Arg Lys Arg Val
    85           90           95
Val Leu Leu Gln Thr Ala Thr Leu Leu Gly Val Leu Leu Leu Gly Tyr
    100          105          110
Gly Tyr Phe Trp Leu Leu Val Pro Asn Pro Glu Ala Arg Leu Gln Gln
25      115          120          125
Leu Gly Leu Phe Cys Ser Val Phe Thr Ile Ser Met Tyr Leu Ser Pro
    130          135          140
Leu Ala Asp Leu Ala Lys Val Ile Gln Thr Lys Ser Thr Gln Cys Leu
    145          150          155          160
30 Ser Tyr Pro Leu Thr Ile Ala Thr Leu Leu Thr Ser Ala Ser Trp Cys
    165          170          175
Leu Tyr Gly Phe Arg Leu Arg Asp Pro Tyr Ile Met Val Ser Asn Phe
    180          185          190
Pro Gly Ile Val Thr Ser Phe Ile Arg Phe Trp Leu Phe Trp Lys Tyr
35      195          200          205
Pro Gln Glu Gln Asp Arg Asn Tyr Trp Leu Leu Gln Thr
    210          215          220

```

## (2) INFORMATION FOR SEQ ID NO: 6:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 251

(B) TYPE: Amino acid

5 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

## (vi) ORIGINAL SOURCE:

10 (A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10230

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

15

Met Ser Asp Ile Gly Asp Trp Phe Arg Ser Ile Pro Ala Ile Thr Arg  
1 5 10 15  
Tyr Trp Phe Ala Ala Thr Val Ala Val Pro Leu Val Gly Lys Leu Gly  
20 25 30  
20 Leu Ile Ser Pro Ala Tyr Leu Phe Leu Trp Pro Glu Ala Phe Leu Tyr  
35 40 45  
Arg Phe Gln Ile Trp Arg Pro Ile Thr Ala Thr Phe Tyr Phe Pro Val  
50 55 60  
Gly Pro Gly Thr Gly Phe Leu Tyr Leu Val Asn Leu Tyr Phe Leu Tyr  
25 65 70 75 80  
Gln Tyr Ser Thr Arg Leu Glu Thr Gly Ala Phe Asp Gly Arg Pro Ala  
85 90 95  
Asp Tyr Leu Phe Met Leu Leu Phe Asn Trp Ile Cys Ile Val Ile Thr  
100 105 110  
30 Gly Leu Ala Met Asp Met Gln Leu Leu Met Ile Pro Leu Ile Met Ser  
115 120 125  
Val Leu Tyr Val Trp Ala Gln Leu Asn Arg Asp Met Ile Val Ser Phe  
130 135 140  
Trp Phe Gly Thr Arg Phe Lys Ala Cys Tyr Leu Pro Trp Val Ile Leu  
35 145 150 155 160  
Gly Phe Asn Tyr Ile Ile Gly Gly Ser Val Ile Asn Glu Leu Ile Gly  
165 170 175  
Asn Leu Val Gly His Leu Tyr Phe Phe Leu Met Phe Arg Tyr Pro Met

91

180 185 190  
 Asp Leu Gly Gly Arg Asn Phe Leu Ser Thr Pro Gln Phe Leu Tyr Arg  
 195 200 205  
 Trp Leu Pro Ser Arg Arg Gly Gly Val Ser Gly Phe Gly Val Pro Pro  
 5 210 215 220  
 Ala Ser Met Arg Arg Ala Ala Asp Gln Asn Gly Gly Gly Arg His  
 225 230 235 240  
 Asn Trp Gly Gln Gly Phe Arg Leu Gly Asp Gln  
 245 250

10

## (2) INFORMATION FOR SEQ ID NO: 7:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 106  
 15 (B) TYPE: Amino acid  
 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

20

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Epidermoid carcinoma  
 (C) CELL LINE: KB  
 (D) CLONE NAME: HP10389

25

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Ala Thr Pro Gly Pro Val Ile Pro Glu Val Pro Phe Glu Pro Ser  
 1 5 10 15  
 30 Lys Pro Pro Val Ile Glu Gly Leu Ser Pro Thr Val Tyr Arg Asn Pro  
 20 25 30  
 Glu Ser Phe Lys Glu Lys Phe Val Arg Lys Thr Arg Glu Asn Pro Val  
 35 40 45  
 Val Pro Ile Gly Cys Leu Ala Thr Ala Ala Ala Leu Thr Tyr Gly Leu  
 35 50 55 60  
 Tyr Ser Phe His Arg Gly Asn Ser Gln Arg Ser Gln Leu Met Met Arg  
 65 70 75 80  
 Thr Arg Ile Ala Ala Gln Gly Phe Thr Val Ala Ala Ile Leu Leu Gly

92

85 90 95  
 Leu Ala Val Thr Ala Met Lys Ser Arg Pro  
 100 105

5

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 78

10 (B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

15 (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10408

20 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Met Gly Ser Gly Leu Pro Leu Val Leu Leu Leu Thr Leu Leu Gly Ser  
 1 5 10 15  
 Ser His Gly Thr Gly Pro Gly Met Thr Leu Gln Leu Lys Leu Lys Glu  
 25 20 25 30  
 Ser Phe Leu Thr Asn Ser Ser Tyr Glu Ser Ser Phe Leu Glu Leu Leu  
 35 40 45  
 Glu Lys Leu Cys Leu Leu Leu His Leu Pro Ser Gly Thr Ser Val Thr  
 50 55 60  
 30 Leu His His Ala Arg Ser Gln His His Val Val Cys Asn Thr  
 65 70 75

(2) INFORMATION FOR SEQ ID NO: 9:

35 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 314

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

- 5 (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10412

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

10

Met Val Ala Pro Val Trp Tyr Leu Val Ala Ala Ala Leu Leu Val Gly  
 1 5 10 15  
 Phe Ile Leu Phe Leu Thr Arg Ser Arg Gly Arg Ala Ala Ser Ala Gly  
 20 25 30  
 15 Gln Glu Pro Leu His Asn Glu Glu Leu Ala Gly Ala Gly Arg Val Ala  
 35 40 45  
 Gln Pro Gly Pro Leu Glu Pro Glu Glu Pro Arg Ala Gly Gly Arg Pro  
 50 55 60  
 Arg Arg Arg Arg Asp Leu Gly Ser Arg Leu Gln Ala Gln Arg Arg Ala  
 20 65 70 75 80  
 Gln Arg Val Ala Trp Ala Glu Ala Asp Glu Asn Glu Glu Glu Ala Val  
 85 90 95  
 Ile Leu Ala Gln Glu Glu Glu Gly Val Glu Lys Pro Ala Glu Thr His  
 100 105 110  
 25 Leu Ser Gly Lys Ile Gly Ala Lys Lys Leu Arg Lys Leu Glu Glu Lys  
 115 120 125  
 Gln Ala Arg Lys Ala Gln Arg Glu Ala Glu Glu Ala Glu Arg Glu Glu  
 130 135 140  
 Arg Lys Arg Leu Glu Ser Gln Arg Glu Ala Glu Trp Lys Lys Glu Glu  
 30 145 150 155 160  
 Glu Arg Leu Arg Leu Glu Glu Glu Gln Lys Glu Glu Glu Glu Arg Lys  
 165 170 175  
 Ala Arg Glu Glu Gln Ala Gln Arg Glu His Glu Glu Tyr Leu Lys Leu  
 180 185 190  
 35 Lys Glu Ala Phe Val Val Glu Glu Glu Gly Val Gly Glu Thr Met Thr  
 195 200 205  
 Glu Glu Gln Ser Gln Ser Phe Leu Thr Glu Phe Ile Asn Tyr Ile Lys  
 210 215 220

94

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Gln Ser Lys Val Val Leu Leu Glu Asp Leu Ala Ser Gln Val Gly Leu
225                      230                      235                      240
Arg Thr Gln Asp Thr Ile Asn Arg Ile Gln Asp Leu Leu Ala Glu Gly
                      245                      250                      255
5 Thr Ile Thr Gly Val Ile Asp Asp Arg Gly Lys Phe Ile Tyr Ile Thr
                      260                      265                      270
Pro Glu Glu Leu Ala Ala Val Ala Asn Phe Ile Arg Gln Arg Gly Arg
                      275                      280                      285
Val Ser Ile Ala Glu Leu Ala Gln Ala Ser Asn Ser Leu Ile Ala Trp
10      290                      295                      300
Gly Arg Glu Ser Pro Ala Gln Ala Pro Ala
305                      310

```

15 (2) INFORMATION FOR SEQ ID NO: 10:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 195

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

20 (ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

25 (B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10413

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

```

30 Met Ala Ala Glu Asp Val Val Ala Thr Gly Ala Asp Pro Ser Asp Leu
    1             5             10             15
    Glu Ser Gly Gly Leu Leu His Glu Ile Phe Thr Ser Pro Leu Asn Leu
          20             25             30
    Leu Leu Leu Gly Leu Cys Ile Phe Leu Leu Tyr Lys Ile Val Arg Gly
35          35             40             45
    Asp Gln Pro Ala Ala Ser Gly Asp Ser Asp Asp Asp Glu Pro Pro Pro
        50             55             60
    Leu Pro Arg Leu Lys Arg Arg Asp Phe Thr Pro Ala Glu Leu Arg Arg

```



95

	65		70		75		80									
	Phe	Asp	Gly	Val	Gln	Asp	Pro	Arg	Ile	Leu	Met	Ala	Ile	Asn	Gly	Lys
					85					90					95	
	Val	Phe	Asp	Val	Thr	Lys	Gly	Arg	Lys	Phe	Tyr	Gly	Pro	Glu	Gly	Pro
5				100					105					110		
	Tyr	Gly	Val	Phe	Ala	Gly	Arg	Asp	Ala	Ser	Arg	Gly	Leu	Ala	Thr	Phe
				115				120					125			
	Cys	Leu	Asp	Lys	Glu	Ala	Leu	Lys	Asp	Glu	Tyr	Asp	Asp	Leu	Ser	Asp
				130				135					140			
10	Leu	Thr	Ala	Ala	Gln	Gln	Glu	Thr	Leu	Ser	Asp	Trp	Glu	Ser	Gln	Phe
				145				150				155			160	
	Thr	Phe	Lys	Tyr	His	His	Val	Gly	Lys	Leu	Leu	Lys	Glu	Gly	Glu	Glu
					165					170				175		
	Pro	Thr	Val	Tyr	Ser	Asp	Glu	Glu	Glu	Pro	Lys	Asp	Glu	Ser	Ala	Arg
15				180						185				190		
	Lys	Asn	Asp													
				195												

## 20 (2) INFORMATION FOR SEQ ID NO: 11:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 462

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

## 25 (ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

## 30 (B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10415

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

35	Met	Leu	Asp	Phe	Ala	Ile	Phe	Ala	Val	Thr	Phe	Leu	Leu	Ala	Leu	Val
	1				5					10				15		
	Gly	Ala	Val	Leu	Tyr	Leu	Tyr	Pro	Ala	Ser	Arg	Gln	Ala	Ala	Gly	Ile
				20						25				30		

96

Pro Gly Ile Thr Pro Thr Glu Glu Lys Asp Gly Asn Leu Pro Asp Ile  
 35 40 45  
 Val Asn Ser Gly Ser Leu His Glu Phe Leu Val Asn Leu His Glu Arg  
 50 55 60  
 5 Tyr Gly Pro Val Val Ser Phe Trp Phe Gly Arg Arg Leu Val Val Ser  
 65 70 75 80  
 Leu Gly Thr Val Asp Val Leu Lys Gln His Ile Asn Pro Asn Lys Thr  
 85 90 95  
 Leu Asp Pro Phe Glu Thr Met Leu Lys Ser Leu Leu Arg Tyr Gln Ser  
 10 100 105 110  
 Gly Gly Gly Ser Val Ser Glu Asn His Met Arg Lys Lys Leu Tyr Glu  
 115 120 125  
 Asn Gly Val Thr Asp Ser Leu Lys Ser Asn Phe Ala Leu Leu Leu Lys  
 130 135 140  
 15 Leu Ser Glu Glu Leu Leu Asp Lys Trp Leu Ser Tyr Pro Glu Thr Gln  
 145 150 155 160  
 His Val Pro Leu Ser Gln His Met Leu Gly Phe Ala Met Lys Ser Val  
 165 170 175  
 Thr Gln Met Val Met Gly Ser Thr Phe Glu Asp Asp Gln Glu Val Ile  
 20 180 185 190  
 Arg Phe Gln Lys Asn His Gly Thr Val Trp Ser Glu Ile Gly Lys Gly  
 195 200 205  
 Phe Leu Asp Gly Ser Leu Asp Lys Asn Met Thr Arg Lys Lys Gln Tyr  
 210 215 220  
 25 Glu Asp Ala Leu Met Gln Leu Glu Ser Val Leu Arg Asn Ile Ile Lys  
 225 230 235 240  
 Glu Arg Lys Gly Arg Asn Phe Ser Gln His Ile Phe Ile Asp Ser Leu  
 245 250 255  
 Val Gln Gly Asn Leu Asn Asp Gln Gln Ile Leu Glu Asp Ser Met Ile  
 30 260 265 270  
 Phe Ser Leu Ala Ser Cys Ile Ile Thr Ala Lys Leu Cys Thr Trp Ala  
 275 280 285  
 Ile Cys Phe Leu Thr Thr Ser Glu Glu Val Gln Lys Lys Leu Tyr Glu  
 290 295 300  
 35 Glu Ile Asn Gln Val Phe Gly Asn Gly Pro Val Thr Pro Glu Lys Ile  
 305 310 315 320  
 Glu Gln Leu Arg Tyr Cys Gln His Val Leu Cys Glu Thr Val Arg Thr  
 325 330 335

97

Ala Lys Leu Thr Pro Val Ser Ala Gln Leu Gln Asp Ile Glu Gly Lys  
                   340                  345                  350  
 Ile Asp Arg Phe Ile Ile Pro Arg Glu Thr Leu Val Leu Tyr Ala Leu  
                   355                  360                  365  
 5 Gly Val Val Leu Gln Asp Pro Asn Thr Trp Pro Ser Pro His Lys Phe  
                   370                  375                  380  
 Asp Pro Asp Arg Phe Asp Asp Glu Leu Val Met Lys Thr Phe Ser Ser  
 385                  390                  395                  400  
 Leu Gly Phe Ser Gly Thr Gln Glu Cys Pro Glu Leu Arg Phe Ala Tyr  
 10                  405                  410                  415  
 Met Val Thr Thr Val Leu Leu Ser Val Leu Val Lys Arg Leu His Leu  
                   420                  425                  430  
 Leu Ser Val Glu Gly Gln Val Ile Glu Thr Lys Tyr Glu Leu Val Thr  
                   435                  440                  445  
 15 Ser Ser Arg Glu Glu Ala Trp Ile Thr Val Ser Lys Arg Tyr  
                   450                  455                  460

## (2) INFORMATION FOR SEQ ID NO: 12:

## 20 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 247

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

25 (iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

30 (D) CLONE NAME: HP10419

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

Met Gly Ala Ala Val Phe Phe Gly Cys Thr Phe Val Ala Phe Gly Pro  
 35 1                  5                  10                  15  
 Ala Phe Ala Leu Phe Leu Ile Thr Val Ala Gly Asp Pro Leu Arg Val  
                   20                  25                  30  
 Ile Ile Leu Val Ala Gly Ala Phe Phe Trp Leu Val Ser Leu Leu Leu

98

35                      40                      45  
 Ala Ser Val Val Trp Phe Ile Leu Val His Val Thr Asp Arg Ser Asp  
 50                      55                      60  
 Ala Arg Leu Gln Tyr Gly Leu Leu Ile Phe Gly Ala Ala Val Ser Val  
 5    65                      70                      75                      80  
 Leu Leu Gln Glu Val Phe Arg Phe Ala Tyr Tyr Lys Leu Leu Lys Lys  
 85                      90                      95  
 Ala Asp Glu Gly Leu Ala Ser Leu Ser Glu Asp Gly Arg Ser Pro Ile  
 100                      105                      110  
 10 Ser Ile Arg Gln Met Ala Tyr Val Ser Gly Leu Ser Phe Gly Ile Ile  
 115                      120                      125  
 Ser Gly Val Phe Ser Val Ile Asn Ile Leu Ala Asp Ala Leu Gly Pro  
 130                      135                      140  
 Gly Val Val Gly Ile His Gly Asp Ser Pro Tyr Tyr Phe Leu Thr Ser  
 15    145                      150                      155                      160  
 Ala Phe Leu Thr Ala Ala Ile Ile Leu Leu His Thr Phe Trp Gly Val  
 165                      170                      175  
 Val Phe Phe Asp Ala Cys Glu Arg Arg Arg Tyr Trp Ala Leu Gly Leu  
 180                      185                      190  
 20 Val Val Gly Ser His Leu Leu Thr Ser Gly Leu Thr Phe Leu Asn Pro  
 195                      200                      205  
 Trp Tyr Glu Ala Ser Leu Leu Pro Ile Tyr Ala Val Thr Val Ser Met  
 210                      215                      220  
 Gly Leu Trp Ala Phe Ile Thr Ala Gly Gly Ser Leu Arg Ser Ile Gln  
 25    225                      230                      235                      240  
 Arg Ser Leu Leu Cys Lys Asp  
 245

30 (2) INFORMATION FOR SEQ ID NO: 13:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 113

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

35 (ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

99

(A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10424

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

```

Met Asn Phe Tyr Leu Leu Leu Ala Ser Ser Ile Leu Cys Ala Leu Ile
  1             5             10             15
Val Phe Trp Lys Tyr Arg Arg Phe Gln Arg Asn Thr Gly Glu Met Ser
10             20             25             30
Ser Asn Ser Thr Ala Leu Ala Leu Val Arg Pro Ser Ser Ser Gly Leu
      35             40             45
Ile Asn Ser Asn Thr Asp Asn Asn Leu Ala Val Tyr Asp Leu Ser Arg
      50             55             60
15 Asp Ile Leu Asn Asn Phe Pro His Ser Ile Ala Arg Gln Lys Arg Ile
      65             70             75             80
Leu Val Asn Leu Ser Met Val Glu Asn Lys Leu Val Glu Leu Glu His
      85             90             95
Thr Leu Leu Ser Lys Gly Phe Arg Gly Ala Ser Pro His Arg Lys Ser
20             100            105            110
Thr
  
```

(2) INFORMATION FOR SEQ ID NO: 14:

25 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 365  
 (B) TYPE: Amino acid  
 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

30 (iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Epidermoid carcinoma  
 35 (C) CELL LINE: KB  
 (D) CLONE NAME: HP10428

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

100

Met Gly Arg Trp Ala Leu Asp Val Ala Phe Leu Trp Lys Ala Val Leu  
 1 5 10 15  
 Thr Leu Gly Leu Val Leu Leu Tyr Tyr Cys Phe Ser Ile Gly Ile Thr  
 20 25 30  
 5 Phe Tyr Asn Lys Trp Leu Thr Lys Ser Phe His Phe Pro Leu Phe Met  
 35 40 45  
 Thr Met Leu His Leu Ala Val Ile Phe Leu Phe Ser Ala Leu Ser Arg  
 50 55 60  
 Ala Leu Val Gln Cys Ser Ser His Arg Ala Arg Val Val Leu Ser Trp  
 10 65 70 75 80  
 Ala Asp Tyr Leu Arg Arg Val Ala Pro Thr Ala Leu Ala Thr Ala Leu  
 85 90 95  
 Asp Val Gly Leu Ser Asn Trp Ser Phe Leu Tyr Val Thr Val Ser Leu  
 100 105 110  
 15 Tyr Thr Met Thr Lys Ser Ser Ala Val Leu Phe Ile Leu Ile Phe Ser  
 115 120 125  
 Leu Ile Phe Lys Leu Glu Glu Leu Arg Ala Ala Leu Val Leu Val Val  
 130 135 140  
 Leu Leu Ile Ala Gly Gly Leu Phe Met Phe Thr Tyr Lys Ser Thr Gln  
 20 145 150 155 160  
 Phe Asn Val Glu Gly Phe Ala Leu Val Leu Gly Ala Ser Phe Ile Gly  
 165 170 175  
 Gly Ile Arg Trp Thr Leu Thr Gln Met Leu Leu Gln Lys Ala Glu Leu  
 180 185 190  
 25 Gly Leu Gln Asn Pro Ile Asp Thr Met Phe His Leu Gln Pro Leu Met  
 195 200 205  
 Phe Leu Gly Leu Phe Pro Leu Phe Ala Val Phe Glu Gly Leu His Leu  
 210 215 220  
 Ser Thr Ser Glu Lys Ile Phe Arg Phe Gln Asp Thr Gly Leu Leu Leu  
 30 225 230 235 240  
 Arg Val Leu Gly Ser Leu Phe Leu Gly Gly Ile Leu Ala Phe Gly Leu  
 245 250 255  
 Gly Phe Ser Glu Phe Leu Leu Val Ser Arg Thr Ser Ser Leu Thr Leu  
 260 265 270  
 35 Ser Ile Ala Gly Ile Phe Lys Glu Val Cys Thr Leu Leu Leu Ala Ala  
 275 280 285  
 His Leu Leu Gly Asp Gln Ile Ser Leu Leu Asn Trp Leu Gly Phe Ala  
 290 295 300

101

Leu Cys Leu Ser Gly Ile Ser Leu His Val Ala Leu Lys Ala Leu His  
 305                      310                      315                      320  
 Ser Arg Gly Asp Gly Gly Pro Lys Ala Leu Lys Gly Leu Gly Ser Ser  
                          325                      330                      335  
 5 Pro Asp Leu Glu Leu Leu Leu Arg Ser Ser Gln Arg Glu Glu Gly Asp  
                          340                      345                      350  
 Asn Glu Glu Glu Glu Tyr Phe Val Ala Gln Gly Gln Gln  
                          355                      360                      365

10

(2) INFORMATION FOR SEQ ID NO: 15:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 226

(B) TYPE: Amino acid

15

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

20

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10429

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

25

Met Pro Thr Thr Lys Lys Thr Leu Met Phe Leu Ser Ser Phe Phe Thr  
 1                      5                      10                      15  
 Ser Leu Gly Ser Phe Ile Val Ile Cys Ser Ile Leu Gly Thr Gln Ala  
                          20                      25                      30  
 30 Trp Ile Thr Ser Thr Ile Ala Val Arg Asp Ser Ala Ser Asn Gly Ser  
                          35                      40                      45  
 Ile Phe Ile Thr Tyr Gly Leu Phe Arg Gly Glu Ser Ser Glu Glu Leu  
                          50                      55                      60  
 Ser His Gly Leu Ala Glu Pro Lys Lys Lys Phe Ala Val Leu Glu Ile  
 35 65                      70                      75                      80  
 Leu Asn Asn Ser Ser Gln Lys Thr Leu His Ser Val Thr Ile Leu Phe  
                          85                      90                      95  
 Leu Val Leu Ser Leu Ile Thr Ser Leu Leu Ser Ser Gly Phe Thr Phe

102

[illegible]

20 (2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 129

(B) TYPE: Amino acid

(D) TOPOLOGY: Linear

25 (ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

30 (B) CELL KIND: Liver

(D) CLONE NAME: HP10432

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

35 Met Ala Arg Gly Ser Leu Arg Arg Leu Leu Arg Leu Leu Val Leu Gly  
1 5 10 15  
Leu Trp Leu Ala Leu Leu Arg Ser Val Ala Gly Glu Gln Ala Pro Gly  
20 25 30



103

Thr Ala Pro Cys Ser Arg Gly Ser Ser Trp Ser Ala Asp Leu Asp Lys  
           35                          40                          45  
 Cys Met Asp Cys Ala Ser Cys Arg Ala Arg Pro His Ser Asp Phe Cys  
           50                          55                          60  
 5 Leu Gly Cys Ala Ala Ala Pro Pro Ala Pro Phe Arg Leu Leu Trp Pro  
      65                          70                          75                          80  
 Ile Leu Gly Gly Ala Leu Ser Leu Thr Phe Val Leu Gly Leu Leu Ser  
                           85                          90                          95  
 Gly Phe Leu Val Trp Arg Arg Cys Arg Arg Arg Glu Lys Phe Thr Thr  
 10                          100                          105                          110  
 Pro Ile Glu Glu Thr Gly Gly Glu Gly Cys Pro Ala Val Ala Leu Ile  
           115                          120                          125  
 Gln

15

(2) INFORMATION FOR SEQ ID NO: 17:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 163

20 (B) TYPE: Amino acid

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: Protein

(iii) HYPOTHETICAL: No

25 (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Liver

(D) CLONE NAME: HP10433

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

Met Arg Arg Leu Leu Ile Pro Leu Ala Leu Trp Leu Gly Ala Val Gly  
      1                          5                          10                          15  
 Val Gly Val Ala Glu Leu Thr Glu Ala Gln Arg Arg Gly Leu Gln Val  
 35                          20                          25                          30  
 Ala Leu Glu Glu Phe His Lys His Pro Pro Val Gln Trp Ala Phe Gln  
           35                          40                          45  
 Glu Thr Ser Val Glu Ser Ala Val Asp Thr Pro Phe Pro Ala Gly Ile

104

50                                      55                                      60  
 Phe Val Arg Leu Glu Phe Lys Leu Gln Gln Thr Ser Cys Arg Lys Arg  
 65                                      70                                      75                                      80  
 Asp Trp Lys Lys Pro Glu Cys Lys Val Arg Pro Asn Gly Arg Lys Arg  
 5                                      85                                      90                                      95  
 Lys Cys Leu Ala Cys Ile Lys Leu Gly Ser Glu Asp Lys Val Leu Gly  
 100                                      105                                      110  
 Arg Leu Val His Cys Pro Ile Glu Thr Gln Val Leu Arg Glu Ala Glu  
 115                                      120                                      125  
 10 Glu His Gln Glu Thr Gln Cys Leu Arg Val Gln Arg Ala Gly Glu Asp  
 130                                      135                                      140  
 Pro His Ser Phe Tyr Phe Pro Gly Gln Phe Ala Phe Ser Lys Ala Leu  
 145                                      150                                      155                                      160  
 Pro Arg Ser

15

## (2) INFORMATION FOR SEQ ID NO: 18:

## (i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 193  
 (B) TYPE: Amino acid  
 (D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: Protein

## (iii) HYPOTHETICAL: No

## 25 (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10480

## 30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

Met Ile Arg Cys Gly Leu Ala Cys Glu Arg Cys Arg Trp Ile Leu Pro  
 1                                      5                                      10                                      15  
 Leu Leu Leu Leu Ser Ala Ile Ala Phe Asp Ile Ile Ala Leu Ala Gly  
 35                                      20                                      25                                      30  
 Arg Gly Trp Leu Gln Ser Ser Asp His Gly Gln Thr Ser Ser Leu Trp  
 35                                      40                                      45  
 Trp Lys Cys Ser Gln Glu Gly Gly Gly Ser Gly Ser Tyr Glu Glu Gly

105

50                      55                      60  
 Cys Gln Ser Leu Met Glu Tyr Ala Trp Gly Arg Ala Ala Ala Met  
 65                      70                      75                      80  
 Leu Phe Cys Gly Phe Ile Ile Leu Val Ile Cys Phe Ile Leu Ser Phe  
 5                      85                      90                      95  
 Phe Ala Leu Cys Gly Pro Gln Met Leu Val Phe Leu Arg Val Ile Gly  
 100                      105                      110  
 Gly Leu Leu Ala Leu Ala Ala Val Phe Gln Ile Ile Ser Leu Val Ile  
 115                      120                      125  
 10 Tyr Pro Val Lys Tyr Thr Gln Thr Phe Thr Leu His Ala Asn Arg Ala  
 130                      135                      140  
 Val Thr Tyr Ile Tyr Asn Trp Ala Tyr Gly Phe Gly Trp Ala Ala Thr  
 145                      150                      155                      160  
 Ile Ile Leu Ile Gly Cys Ala Phe Phe Phe Cys Cys Leu Pro Asn Tyr  
 15                      165                      170                      175  
 Glu Asp Asp Leu Leu Gly Asn Ala Lys Pro Arg Tyr Phe Tyr Thr Ser  
 180                      185                      190  
 Ala

20

(2) INFORMATION FOR SEQ ID NO: 19:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1146

(B) TYPE: Nucleic acid

25

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

30

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Linear

(D) CLONE NAME: HP01263

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

35

ATGGGTCTGC TCCTTCCCCT GGCACCTCTGC ATCCTAGTCC TGTGCTGCGG AGCAATGTCT 60  
 CCACCCAGC TGGCCCTCAA CCCCTCGGCT CTGCTCTCCC GGGGCTGCAA TGACTCCGAT 120  
 GTGCTGGCAG TTGCAGGCTT TGCCCTGCGG GATATTAACA AAGACAGAAA GGATGGCTAT 180

106

GTGCTGAGAC TCAACCGAGT GAACGACGCC CAGGAATACA GACGGGGTGG CCTGGGATCT 240  
 CTGTTCTATC TTACACTGGA TGTGCTAGAG ACTGACTGCC ATGTGCTCAG AAAGAAGGCA 300  
 TGGCAAGACT GTGGAATGAG GATATTTTTT GAATCAGTTT ATGGTCAATG CAAAGCAATA 360  
 TTTTATATGA ACAACCCAAG TAGAGTTCTC TATTTAGCTG CTTATAACTG TACTCTTCGC 420  
 5 CCAGTTTCAA AAAAAAAGAT TTACATGACG TGCCCTGACT GCCCAAGCTC CATACCCACT 480  
 GACTCTTCCA ATCACCAAGT GCTGGAGGCT GCCACCGAGT CTCTTGCGAA ATACAACAAT 540  
 GAGAACACAT CCAAGCAGTA TTCTCTCTC AAAGTCACCA GGGCTTCTAG CCAGTGGGTG 600  
 GTCGGCCCTT CTTACTTTGT GGAATACTTA ATTAAAGAAT CACCATGTAC TAAATCCAG 660  
 GCCAGCAGCT GTTCACTTCA GTCCTCCGAC TCTGTGCCTG TTGGTCTTTG CAAAGGTTCT 720  
 10 CTGACTCGAA CACTGCGGA AAAGTTTGTC TCTGTGACTT GTGACTTCTT TGAATCACAG 780  
 GCTCCAGCCA CTGGAAGTGA AAAGTCTGCT GTTAACCAGA AACCTACAAA CCTTCCCAAG 840  
 GTGGAAGAAT CCCAGCAGAA AAACACCCCC CCAACAGACT CCCCCTCCAA AGCTGGGCCA 900  
 AGAGGATCTG TCCAATATCT TCCTGACTTG GATGATAAAA ATCCCAGGA AAAGGGCCCT 960  
 CAGGAGGCCT TTCCTGTGCA TCTGGACCTA ACCACGAATC CCCAGGGAGA AACCTGGAT 1020  
 15 ATTTCTTCC TCTTCTGGA GCCTATGGAG GAGAAGCTGG TTGTCCTGCC TTTCCCCAAA 1080  
 GAAAAAGCAC GCACTGCTGA GTGCCAGGG CCAGCCAGA ATGCCAGCCC TCTTGTCTT 1140  
 CCGCCA 1146

20 (2) INFORMATION FOR SEQ ID NO: 20:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 951

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

25 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

30 (B) CELL KIND: Liver

(D) CLONE NAME: HP01299

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

35 ATGTGGCTCT ACCTGGCGGC CTTCGTGGGC CTGTACTACC TTCTGCACTG GTACCGGGAG 60  
 AGGCAGGTGG TGAGCCACCT CCAAGACAAG TATGTCTTTA TCACGGGCTG TGAATCGGGC 120  
 TTTGGGAACC TGCTGGCCAG ACAGCTGGAT GCACGAGGCT TGAGAGTGCT GGCTGCGTGT 180  
 CTGACGGAGA AGGGGGCCGA GCAGCTGAGG GGCCAGACGT CTGACAGGCT GGAGACGGTG 240

107

ACCCTGGATG TTACCAAGAT GGAGAGCATC GCTGCAGCTA CTCAGTGGGT GAAGGAGCAT 300  
 GTGGGGGACA GAGGACTCTG GGGACTGGTG AACAAATGCAG GCATTCTTAC ACCAATTACC 360  
 TTATGTGAGT GGCTGAACAC TGAGGACTCT ATGAATATGC TCAAAGTGAA CCTCATTGGT 420  
 GTGATCCAGG TGACCTTGAG CATGCTTCCT TTGGTGAGGA GAGCACGGGG AAGAATTGTC 480  
 5 AATGTCTCCA GCATTCTGGG AAGAGTTGCT TTCTTTGTAG GAGGCTACTG TGTCTCCAAG 540  
 TATGGAGTGG AAGCCTTTTC AGATATTCTG AGGCGTGAGA TTCAACATTT TGGGGTGAAA 600  
 ATCAGCATAG TTGAACCTGG CTAATTCAGA ACGGGAATGA CAAACATGAC ACAGTCCTTA 660  
 GAGCGAATGA AGCAAAGTTG GAAAGAAGCC CCCAAGCATA TTAAGGAGAC CTATGGACAG 720  
 CAGTATTTTG ATGCCCTTTA CAATATCATG AAGGAAGGGC TGTGAATTG TAGCACAAAC 780  
 10 CTGAACCTGG TCACTGACTG CATGGAACAT GCTCTGACAT CGGTGCATCC GCGAACTCGA 840  
 TATTCAGCTG GCTGGGATGC TAAATTTTTC TTCATCCCTC TATCTTATTT ACCTACATCA 900  
 CTGGCAGACT ACATTTTGAC TAGATCTTGG CCCAAACCAG CCCAGGCAGT C 951

15 (2) INFORMATION FOR SEQ ID NO: 21:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 888

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

20 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

25 (B) CELL KIND: Liver

(D) CLONE NAME: HP01347

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

30 ATGAGTGA CT CCAAGGAACC AAGGGTGCAG CAGCTGGGCC TCCTGGGGTG TCTTGCCCAT 60  
 GCGGCCCTGG TGCTGCAACT CCTCTCCTTC ATGCTCTTGG CTGGGGTCCT GGTGGCCATC 120  
 CTGTCCAAG TGCCAAGGT CCCAGCTCC CTAAGTCAGG AACAAATCCGA GCAAGACGCA 180  
 ATCTACCAGA ACCTGACCCA GCTTAAAGCT GCAGTGGGTG AGCTCTCAGA GAAATCCAAG 240  
 CTGCAGGAGA TCTACCAGGA GCTGACCCAG CTGAAGGCTG CAGTGGGTGA GTTGCCAGAG 300  
 35 AAATCCAAGC TGCAGGAGAT CTACCAGGAG CTGACCCGGC TGAAGGCTGC AGTGGGTGAG 360  
 TTGCCAGAGA AATCCAAGCT GCAGGAGATC TACCAGGAGC TGACCCGGCT GAAGGCTGCA 420  
 GTGGGTGAGT TGCCAGAGAA ATCCAAGCTG CAGGAGATCT ACCAGGAGCT GACCCGGCTG 480  
 AAGGCTGCAG TGGGTGAGTT GCCAGAGAAA TCCAAGCTGC AGGAGATCTA CCAGGAGCTG 540

108

ACGGAGCTGA AGGCTGCAGT GGGTGAGTTG CCAGAGAAAT CCAAGCTGCA GGAGATCTAC 600  
CAGGAGCTGA CCCAGCTGAA GGCTGCAGTG GGTGAGTTGC CAGACCAGTC CAAGCAGCAG 660  
CAAATCTATC AAGAACTGAC CGATTTGAAG ACTGCATTG AACGCCTGTG CCGCCACTGT 720  
CCCAAGGACT GGACATTCTT CCAAGGAAAC TGTTACTTCA TGTCTAACTC CCAGCGGAAC 780  
5 TGGCAGGACT CCGTCACCGC CTGCCAGGAA GTGAGGGCCC AGCTCGTCGT AATCAAACT 840  
GCTGAGGAGC AGCTTCCAGC GGTACTGGAA CAGTGGAGAA CCCAACAA 888

## (2) INFORMATION FOR SEQ ID NO: 22:

## 10 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 591  
(B) TYPE: Nucleic acid  
(C) STRANDEDNESS: Double  
(D) TOPOLOGY: Linear

## 15 (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
(B) CELL KIND: Stomach cancer  
20 (D) CLONE NAME: HP01440

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

ATGTGTACGG GAAAATGTGC CCGCTGTGTG GGGCTCTCCC TCATTACCCT CTGCCTCGTC 60  
25 TGCATTGTGG CCAACGCCCT CCTGCTGGTA CCTAATGGGG AGACCTCCTG GACCAACACC 120  
AACCATCTCA GCTTGCAAGT CTGGCTCATG GGCGGCTTCA TTGGCGGGGG CCTAATGGTA 180  
CTGTGTCCGG GGATTGCAGC CGTTCGGGCA GGGGGCAAGG GCTGCTGTGG TGCTGGGTGC 240  
TGTGAAACC GCTGCAGGAT GCTGCGCTCG GTCTTCTCCT CGGCGTTCGG GGTGCTTGGT 300  
GCCATCTACT GCCTCTCGGT GTCTGGAGCT GGGCTCCGAA ATGGACCCAG ATGCTTAATG 360  
30 AACGGCGAGT GGGGCTACCA CTTCGAAGAC ACCGCGGGAG CTTACTTGCT CAACCGCACT 420  
CTATGGGATC GGTGCGAGGC GCGCCCTCGC GTGGTCCCCT GGAATGTGAC GCTCTTCTCG 480  
CTGCTGGTGG CCGCCTCCTG CCTGGAGATA GTACTGTGTG GGATCCAGCT GGTGAACGCG 540  
ACCATGGTG TCTTCTGCGG CGATTGCAGG AAAAAACAGG ACACCCCTCA C 591

35

## (2) INFORMATION FOR SEQ ID NO: 23:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 663

109

(B) TYPE: Nucleic acid  
(C) STRANDEDNESS: Double  
(D) TOPOLOGY: Linear  
(ii) SEQUENCE KIND: cDNA to mRNA

5

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*  
(B) CELL KIND: Stomach cancer  
(D) CLONE NAME: HP01526

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

ATGGAGGCGG GCGGCTTTCT GGA	CTCGCTC	ATTTACGGAG	CATGCGTGGT	CTTCACCCTT	60
GGCATGTTCT CCGCCGGCCT CTC	GGACCTC	AGGCACATGC	GAATGACCCG	GAGTGTGGAC	120
15 AACGTCCAGT TCCTGCCCTT TCT	CACCACG	GAAGTCAACA	ACCTGGGCTG	GCTGAGTTAT	180
GGGGCTTTGA AGGGAGACGG GAT	CCTCATC	GTCGTC	CAACA	CAGTGGGTGC	240
TGCGCTTCAG					
ACCCGTGATA TCTTGGCATA TCT	GCATTAC	TGCCCTCGGA	AGCGTGTGT	GCTCCTACAG	300
ACTGCAACCC TGCTAGGGGT CCT	TCTCCTG	GGTTATGGCT	ACTTTTGGCT	CCTGGTACCC	360
AACCCTGAGG CCCGGCTTCA GC	AGTTGGGC	CTCTTCTGCA	GTGTCTTCAC	CATCAGCATG	420
20 TACCTCTCAC CACTGGCTGA CTT	GGCTAAG	GTGATTCAAA	CTAAATCAAC	CCAATGTCTC	480
TCCTACCCAC TCACCATTCG TAC	CCTTCTC	ACCTCTGCCT	CCTGGTGCCT	CTATGGGTTT	540
CGACTCAGAG ATCCCTATAT CAT	GGTGTCC	AACTTTCCAG	GAATCGTCAC	CAGCTTTATC	600
CGCTTCTGGC TTTTCTGGAA GT	ACCCCCAG	GAGCAAGACA	GGA	ACTACTG	660
ACC				GCTCCTGCAA	663

25

(2) INFORMATION FOR SEQ ID NO: 24:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 753

30

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

35

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10230

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

```

      ATGTCGGACA TCGGAGACTG GTTCAGGAGC ATCCCGGCGA TCACGCGCTA TTGGTTCGCC      60
      GCCACCGTCG CCGTGCCCTT GGTCCGCAAA CTCGGCCTCA TCAGCCCGGC CTACCTCTTC      120
5    CTCTGGCCCG AAGCCTTCCT TTATCGCTTT CAGATTTGGA GGCCAATCAC TGCCACCTTT      180
      TATTTCCCTG TGGGTCCAGG AACTGGATTT CTTTATTTGG TCAATTTATA TTTCTTATAT      240
      CAGTATTCTA CGCGACTTGA AACAGGAGCT TTTGATGGGA GGCCAGCAGA CTATTTATTC      300
      ATGCTCCTCT TTAAGTGGAT TTGCATCGTG ATTACTGGCT TAGCAATGGA TATGCAGTTG      360
      CTGATGATTC CTCTGATCAT GTCAGTACTT TATGTCTGGG CCCAGCTGAA CAGAGACATG      420
10   ATTGTATCAT TTTGGTTTGG AACACGATTT AAGGCCTGCT ATTTACCCTG GGTATCCTT      480
      GGATTCAACT ATATCATCGG AGGCTCGGTA ATCAATGAGC TTATTGAAA TCTGGTTGGA      540
      CATCTTTATT TTTTCCTAAT GTTCAGATAC CCAATGGACT TGGGAGGAAG AAATTTTCTA      600
      TCCACACCTC AGTTTTTGTA CCGCTGGCTG CCCAGTAGGA GAGGAGGAGT ATCAGGATTT      660
      GGTGTGCCCC CTGCTAGCAT GAGGCGAGCT GCTGATCAGA ATGGCGGAGG CGGGAGACAC      720
15   AACTGGGGCC AGGGCTTTCG ACTTGAGAC CAG                                753

```

## (2) INFORMATION FOR SEQ ID NO: 25:

## (i) SEQUENCE CHARACTERISTICS:

```

20   (A) LENGTH: 318
      (B) TYPE: Nucleic acid
      (C) STRANDEDNESS: Double
      (D) TOPOLOGY: Linear

```

## (ii) SEQUENCE KIND: cDNA to mRNA

25

## (vi) ORIGINAL SOURCE:

```

      (A) ORGANISM: Homo sapiens
      (B) CELL KIND: Epidermoid carcinoma
      (C) CELL LINE: KB
30   (D) CLONE NAME: HP10389

```

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

```

      ATGGCGACTC CCGGCCCTGT GATTCCGGAG GTCCCCTTTG AACCATCGAA GCCTCCAGTC      60
35   ATTGAGGGGC TGAGCCCCAC TGTTACAGG AATCCAGAGA GTTCAAGGA AAAGTTCGTT      120
      CGCAAGACCC GCGAGAACCC GGTGGTACCC ATAGGTTGCC TGGCCACGGC GGCCGCCCTC      180
      ACCTACGGCC TCTACTCCTT CCACGGGGC AACAGCCAGC GCTCTCAGCT CATGATGCGC      240
      ACCCGGATCG CCGCCAGGG TTTCACGGTC GCAGCCATCT TGCTGGGTCT GGCTGTCACT      300

```



111

GCTATGAAGT CTCGACCC

318

## (2) INFORMATION FOR SEQ ID NO: 26:

## 5 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 234

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

## 10 (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

15 (D) CLONE NAME: HP10408

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

ATGGGGTCTG GGCTGCCCCCT TGTCTCCTC TTGACCCTCC TTGGCAGCTC ACATGGAACA 60  
20 GGGCCGGGTA TGACTTTGCA ACTGAAGCTG AAGGAGTCTT TTCTGACAAA TTCCTCCTAT 120  
GAGTCCAGCT TCCTGGAATT GCTTGAAAAG CTCTGCCTCC TCCTCCATCT CCCTTCAGGG 180  
ACCAGCGTCA CCCTCCACCA TGCAAGATCT CAACACCATG TTGTCTGCAA CACA 234

## 25 (2) INFORMATION FOR SEQ ID NO: 27:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 942

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

30 (D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

35 (B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10412

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

112

ATGGTGGCGC CTGTGTGGTA CTTGGTAGCG GCGGCTCTGC TAGTCGGCTT TATCCTCTTC 60  
 CTGACTCGCA GCCGGGGCCG GCGGGCATCA GCCGGCCAAG AGCCACTGCA CAATGAGGAG 120  
 CTGGCAGGAG CAGGCCGGGT GGCCAGCCT GGGCCCTGG AGCCTGAGGA GCCGAGAGCT 180  
 GGAGGCAGGC CTCGGCGCCG GAGGGACCTG GGCAGCCGCC TACAGGCCCA GCGTCGAGCC 240  
 5 CAGCGGTGG CCTGGGCAGA AGCAGATGAG AACGAGGAGG AAGCTGTCAT CCTAGCCCAG 300  
 GAGGAGGAAG GTGTGAGAA GCCAGCGAA ACTCACCTGT CGGGGAAAAT TGGAGCTAAG 360  
 AAACTGCGGA AGCTGGAGGA GAAACAAGCG CGAAAGGCC AGCGTGAGGC AGAGGAGGCT 420  
 GAACGTGAGG AGCGGAAACG ACTCGAGTCC CAGCGCGAAG CTGAGTGGA GAAGGAGGAG 480  
 GAGCGGCTTC GCCTGGAGGA GGAGCAGAAG GAGGAGGAG AGAGGAAGGC CCGCGAGGAG 540  
 10 CAGGCCCAGC GGGAGCATGA GGAGTACCTG AACTGAAGG AGGCCTTTGT GGTGGAGGAG 600  
 GAAGGCGTAG GAGAGACCAT GACTGAGGAA CAGTCCCAGA GCTTCCTGAC AGAGTTTCATC 660  
 AACTACATCA AGCAGTCCAA GGTGTGCTC TTGGAAGACC TGGCTTCCCA GGTGGGCCTA 720  
 CGCACTCAGG ACACCATAAA TCGCATCCAG GACCTGCTGG CTGAGGGGAC TATAACAGGT 780  
 GTGATTGACG ACCGGGGCAA GTTCATCTAC ATAACCCAG AGGAACTGGC CGCCGTGGCC 840  
 15 AACTTCATCC GACAGCGGGG CCGGTGTCC ATCGCCGAGC TTGCCCAAGC CAGCAACTCC 900  
 CTCATCGCCT GGGGCCGGA GTCCCCTGCC CAAGCCCCAG CC 942

## (2) INFORMATION FOR SEQ ID NO: 28:

- 20 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 585  
 (B) TYPE: Nucleic acid  
 (C) STRANDEDNESS: Double  
 (D) TOPOLOGY: Linear  
 25 (ii) SEQUENCE KIND: cDNA to mRNA  
 (vi) ORIGINAL SOURCE:  
 (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 30 (D) CLONE NAME: HP10413

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

ATGGCTGCCG AGGATGTGGT GGCGACTGGC GCCGACCCAA GCGATCTGGA GAGCGGCGGG 60  
 35 CTGCTGCATG AGATTTTCAC GTCGCCGCTC AACCTGCTGC TGCTTGGCCT CTGCATCTTC 120  
 CTGCTCTACA AGATCGTGCG CGGGGACCAG CCGGCGGCCA GCGGCGACAG CGACGACGAC 180  
 GAGCCGCCCC CTCTGCCCCG CCTCAAGCGG CGCGACTTCA CCCCCGCCGA GCTGCGGCGC 240  
 TTCGACGGCG TCCAGGACCC GCGCATACTC ATGGCCATCA ACGGCAAGGT GTTCGATGTG 300

113

ACCAAAGGCC GCAAATTCTA CGGGCCCCGAG GGGCCGTATG GGGTCTTTGC TGGAAGAGAT 360  
 GCATCCAGGG GCCTTGCCAC ATTTTGCCCTG GATAAGGAAG CACTGAAGGA TGAGTACGAT 420  
 GACCTTTCTG ACCTCACTGC TGCCCAGCAG GAGACTCTGA GTGACTGGGA GTCTCAGTTC 480  
 ACTTTCAAGT ATCATCACGT GGGCAAACCTG CTGAAGGAGG GGGAGGAGCC CACTGTGTAC 540  
 5 TCAGATGAGG AAGAACCAAA AGATGAGAGT GCCCGGAAAA ATGAT 585

## (2) INFORMATION FOR SEQ ID NO: 29:

## (i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 1386  
 (B) TYPE: Nucleic acid  
 (C) STRANDEDNESS: Double  
 (D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

15

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10415

20

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

ATGTTGGACT TCGCGATCTT CGCCGTTACC TTCTTGCTGG CGTTGGTGGG AGCCGTGCTC 60  
 TACCTCTATC CGGCTTCCAG ACAAGCTGCA GGAATTCCAG GGATTACTCC AACTGAAGAA 120  
 25 AAAGATGGTA ATCTTCCAGA TATTGTGAAT AGTGGAAGTT TGCATGAGTT CCTGGTTAAT 180  
 TTGCATGAGA GATATGGGCC TGTGGTCTCC TTCTGGTTTG GCAGGCGCCT CGTGGTTAGT 240  
 TTGGGCACTG TTGATGTACT GAAGCAGCAT ATCAATCCCA ATAAGACATT GGACCCTTTT 300  
 GAAACCATGC TGAAGTCATT ATTAAGGTAT CAATCTGGTG GTGGCAGTGT GAGTGAAAAC 360  
 CACATGAGGA AAAAATTGTA TGAAAATGGT GTGACTGATT CTCTGAAGAG TAACTTTGCC 420  
 30 CTCCTCCTAA AGCTTTCAGA AGAATTATTA GATAAATGGC TCTCCTACCC AGAGACCCAG 480  
 CACGTGCCCC TCAGCCAGCA TATGCTTGGT TTTGCTATGA AGTCTGTAC ACAGATGGTA 540  
 ATGGGTAGTA CATTTGAAGA TGATCAGGAA GTCATTGCT TCCAGAAGAA TCATGGCACA 600  
 GTTTGGTCTG AGATTGGAAA AGGCTTTCTA GATGGGTCAC TTGATAAAAA CATGACTCGG 660  
 AAAAAACAAT ATGAAGATGC CCTCATGCAA CTGGAGTCTG TTTAAGGAA CATCATAAAA 720  
 35 GAACGAAAAG GAAGGAACCT CAGTCAACAT ATTTTCATTG ACTCCTTAGT ACAAGGGAAC 780  
 CTTAATGACC AACAGATCCT AGAAGACAGT ATGATATTTT CTCTGGCCAG TTGCATAATA 840  
 ACTGCAAAAT TGTGTACCTG GGCAATCTGT TTTTAAACCA CCTCTGAAGA AGTTCAAAAA 900  
 AAATTATATG AAGAGATAAA CCAAGTTTTT GGAAATGGTC CTGTTACTCC AGAGAAAATT 960

114

GAGCAGCTCA GATATTGTCA GCATGTGCTT TGTGAACTG TTCGAACTGC CAAACTGACT 1020  
CCAGTTTCTG CCCAGCTTCA AGATATTGAA GGAAAAATTG ACCGATTAT TATTCCTAGA 1080  
GAGACCCTCG TCCTTTATGC CCTTGGTGTG GTACTTCAGG ATCCTAATAC TTGGCCATCT 1140  
CCACACAAGT TTGATCCAGA TCGGTTTGAT GATGAATTAG TAATGAAAAC TTTTTCCTCA 1200  
5 CTTGGATTCT CAGGCACACA GGAGTGTTCA GAGTTGAGGT TTGCATATAT GGTGACCACA 1260  
GTACTTCTTA GTGTATTGGT GAAGAGACTG CACCTACTTT CTGTGGAGGG ACAGGTTATT 1320  
GAAACAAAGT ATGAACTGGT AACATCATCA AGGGAAGAAG CTTGGATCAC TGTCTCAAAG 1380  
AGATAT 1386

10

(2) INFORMATION FOR SEQ ID NO: 30:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 741

(B) TYPE: Nucleic acid

15 (C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

20 (A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10419

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

25

ATGGGGGCTG CGGTGTTTTT CGGCTGCACT TTCGTCGCGT TCGGCCCCGGC CTTCGCGCTT 60  
TTCTTGATCA CTGTGGCTGG GGACCCGCTT CGCGTTATCA TCCTGGTCGC AGGGGCATTT 120  
TTCTGGCTGG TCTCCCTGCT CCTGGCCTCT GTGGTCTGGT TCATCTTGGT CCATGTGACC 180  
GACCGGTCAG ATGCCCCGGCT CCAGTACGGC CTCCTGATTT TTGGTGCTGC TGTCTCTGTC 240  
30 CTTCTACAGG AGGTGTTCCG CTTTGCCTAC TACAAGCTGC TTAAGAAGGC AGATGAGGGG 300  
TTAGCATCGC TGAGTGAGGA CGGAAGATCA CCCATCTCCA TCCGCCAGAT GGCCTATGTT 360  
TCTGGTCTCT CCTTCGGTAT CATCAGTGGT GTCTTCTCTG TTATCAATAT TTTGGCTGAT 420  
GCACTTGGGC CAGGTGTGGT TGGGATCCAT GGAGACTCAC CCTATTACTT CCTGACTTCA 480  
GCCTTTCTGA CAGCAGCCAT TATCCTGCTC CATACTTTT GGGGAGTTGT GTTCTTTGAT 540  
35 GCCTGTGAGA GGAGACGGTA CTGGGCTTTG GGCCTGGTGG TTGGGAGTCA CCTACTGACA 600  
TCGGGACTGA CATTCCTGAA CCCCTGGTAT GAGGCCAGCC TGCTGCCCAT CTATGCAGTC 660  
ACTGTTTCCA TGGGGCTCTG GGCCTTCATC ACAGCTGGAG GGTCCCTCCG AAGTATTGAG 720  
CGCAGCCTCT TGTGTAAGGA C 741

## (2) INFORMATION FOR SEQ ID NO: 31:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 339

5 (B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

## 10 (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10424

## 15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

```
ATGAACTTCT ATTTACTCCT AGCGAGCAGC ATTCTGTGTG CCTTGATTGT CTTCTGGAAA    60
TATCGCCGCT TTCAGAGAAA CACTGGCGAA ATGTCATCAA ATTCAACTGC TCTTGCACTA    120
GTGAGACCCT CTTCTTCTGG GTTAATTAAC AGCAATACAG ACAACAATCT TGCAGTCTAC    180
20 GACCTCTCTC GGGATATTTT AAATAATTTT CCACACTCAA TAGCCAGGCA GAAGCGAATA    240
TTGGTAAACC TCAGTATGGT GGAAAACAAG CTGGTTGAAC TGGAACATAC TCTACTTAGC    300
AAGGGTTTCA GAGGTGCATC ACCTCACCGG AAATCCACC                          339
```

## 25 (2) INFORMATION FOR SEQ ID NO: 32:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1095

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

30 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

35 (B) CELL KIND: Epidermoid carcinoma

(C) CELL LINE: KB

(D) CLONE NAME: HP10428

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

```

ATGGGGAGGT GGGCCCTCGA TGTGGCCTTT TTGTGGAAGG CCGTGTGAC CCTGGGGCTG      60
GTGCTTCTCT ACTACTGCTT CTCCATCGGC ATCACCTTCT ACAACAAGTG GCTGACAAAG      120
5 AGCTTCCATT TCCCCCTCTT CATGACGATG CTGCACCTGG CCGTGATCTT CCTCTTCTCC      180
GCCCTGTCCA GGGCGCTGGT TCAGTGCTCC AGCCACAGGG CCCGTGTGGT GCTGAGCTGG      240
GCCGACTACC TCAGAAGAGT GGCTCCCACA GCTCTGGCGA CGGCGCTTGA CGTGGGCTTG      300
TCCAAGTGA GCTTCCTGTA TGTACCGTC TCGCTGTACA CAATGACCAA ATCCTCAGCT      360
GTCTCTTCA TCTTGATCTT CTCTCTGATC TTCAAGCTGG AGGAGCTGCG CGCGGCACTG      420
10 GTCCTGGTGG TCCTCCTCAT CGCCGGGGGT CTCTTCATGT TCACCTACAA GTCCACACAG      480
TTCAACGTGG AGGGCTTCGC CTTGGTGCTG GGGGCCTCGT TCATCGGTGG CATTGCTGG      540
ACCCTCACCC AGATGCTCCT GCAGAAGGCT GAACTCGGCC TCCAGAATCC CATCGACACC      600
ATGTTCCACC TGCAGCCACT CATGTTCCCTG GGGCTCTTCC CTCTCTTTGC TGTATTTGAA      660
GGTCTCCATT TGTCACATC TGAGAAAATC TTCCGTTTCC AGGACACAGG GCTGCTCCTG      720
15 CGGGTACTTG GGAGCCTCTT CCTTGGCGGG ATTCTCGCCT TTGGTTTGGG CTTCTCTGAG      780
TTCCTCCTGG TCTCCAGAAC CTCCAGCCTC ACTCTCTCCA TTGCCGGCAT TTTAAGGAA      840
GTCTGCACTT TGCTGTGGC AGCTCATCTG CTGGGCGATC AGATCAGCCT CCTGAACTGG      900
CTGGGCTTCG CCCTCTGCCT CTCGGGAATA TCCCTCCACG TTGCCCTCAA AGCCCTGCAT      960
TCCAGAGGTG ATGGTGGCCC CAAGGCCTTG AAGGGGCTGG GCTCCAGCCC CGACCTGGAG      1020
20 CTGCTGCTCC GGAGCAGCCA GCGGGAGGAA GGTGACAATG AGGAGGAGGA GTACTTTGTG      1080
GCCCAGGGGC AGCAG
                                                                1095

```

## (2) INFORMATION FOR SEQ ID NO: 33:

- 25 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 678
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Double
  - (D) TOPOLOGY: Linear
- 30 (ii) SEQUENCE KIND: cDNA to mRNA
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: *Homo sapiens*
  - (B) CELL KIND: Stomach cancer
  - (D) CLONE NAME: HP10429
- 35

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

117

ATGCCTACCA CAAAGAAGAC ATTGATGTTT TTATCAAGCT TTTTCACCAG CCTTGGGTCC 60  
 TTCATTGTAA TTTGCTCTAT TCTTGGGACA CAAGCATGGA TCACCAGTAC AATTGCTGTT 120  
 AGAGACTCTG CTTCAAATGG GAGCATTTTC ATCACTTACG GACTTTTTTCG TGGGGAGAGT 180  
 AGTGAAGAAT TGAGTCACGG ACTTGCAGAA CCAAAGAAAA AGTTTGCAGT TTTAGAGATA 240  
 5 CTGAATAATT CTTCCCAAAA AACTCTGCAT TCGGTGACTA TCCTGTTTCT GGTCTGAGT 300  
 TTGATCACGT CGCTGCTGAG CTCTGGGTTT ACCTTCTACA ACAGCATCAG CAACCCCTTAC 360  
 CAGACATTCC TGGGGCCGAC GGGGGTGTAC ACCTGGAACG GGCTCGGTGC ATCCTTCGTT 420  
 TTTGTGACCA TGATACTGTT TGTGGCGAAC ACGCAGTCCA ACCAACTCTC CGAAGAGTTG 480  
 TTCCAAATGC TTTACCCGGC AACCACCAGT AAAGGAACGA CCCACAGTTA CGGATACTCG 540  
 10 TTCTGGCTCA TACTGCTCGT CATTCTTCTA AATATAGTCA CTGTAACCAT CATCATTTTC 600  
 TACCAGAAGG CCAGATACCA GCGGAAGCAG GAGCAGAGAA AGCCAATGGA ATATGCTCCA 660  
 AGGGACGGAA TTTTATTC 678

15 (2) INFORMATION FOR SEQ ID NO: 34:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 387

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

20 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

25 (B) CELL KIND: Liver

(D) CLONE NAME: HP10432

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

30 ATGGCTCGGG GCTCGCTGCG CCGGTTGCTG CGGCTCCTCG TGCTGGGGCT CTGGCTGGCG 60  
 TTGCTGCGCT CCGTGGCCGG GGAGCAAGCG CCAGGCACCG CCCCTGCTC CCGCGGCAGC 120  
 TCCTGGAGCG CGGACCTGGA CAAGTGCATG GACTGCGCGT CTTGCAGGGC GCGACCGCAC 180  
 AGCGACTTCT GCCTGGGCTG CGCTGCAGCA CCTCCTGCCC CCTTCCGGCT GCTTTGGCCC 240  
 35 ATCCTTGGGG GCGCTCTGAG CCTGACCTTC GTGCTGGGGC TGCTTTCTGG CTTTTTGGTC 300  
 TGGAGACGAT GCCGCAGGAG AGAGAAGTTC ACCACCCCA TAGAGGAGAC CGGCGGAGAG 360  
 GGCTGCCCAG CTGTGGCGCT GATCCAG 387

## (2) INFORMATION FOR SEQ ID NO: 35:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 489  
(B) TYPE: Nucleic acid  
(C) STRANDEDNESS: Double  
(D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
(B) CELL KIND: Liver  
(D) CLONE NAME: HP10433

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

ATGCGACGGC TGCTGATCCC TCTGGCCCTG TGGCTGGGCG CGGTGGGCGT GGGCGTCGCC 60  
GAGCTCACGG AAGCCCAGCG CCGGGGCCTG CAGGTGGCCC TGGAGGAATT TCACAAGCAC 120  
CGCCCCGTGC AGTGGGCCTT CCAGGAGACC AGTGTGGAGA GCGCCGTGGA CACGCCCTTC 180  
CCAGCTGGAA TATTTGTGAG GCTGGAATTT AAGCTGCAGC AGACAAGCTG CCGGAAGAGG 240  
GACTGGAAGA AACCCGAGTG CAAAGTCAGG CCCAATGGGA GGAAACGGAA ATGCCTGGCC 300  
TGCATCAAAC TGGGCTCTGA GGACAAAGTT CTGGGCCGGT TGGTCCACTG CCCCATAGAG 360  
ACCCAAGTTC TGCGGGAGGC TGAGGAGCAC CAGGAGACCC AGTGCCTCAG GGTGCAGCGG 420  
GCTGGTGAGG ACCCCCACAG CTTCTACTTC CCTGGACAGT TCGCCTTCTC CAAGGCCCTG 480  
CCCCGCAGC 489

## (2) INFORMATION FOR SEQ ID NO: 36:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 579  
(B) TYPE: Nucleic acid  
(C) STRANDEDNESS: Double  
(D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
(B) CELL KIND: Stomach cancer  
(D) CLONE NAME: HP10480



(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

```

      ATGATCCGCT GCGGCCTGGC CTGCGAGCGC TGCCGCTGGA TCCTGCCCCT GCTCCTACTC      60
      AGCGCCATCG CCTTCGACAT CATCGCGCTG GCCGGCCGCG GCTGGTTGCA GTCTAGCGAC      120
5     CACGGCCAGA CGTCCTCGCT GTGGTGGAAA TGCTCCCAAG AGGGCGGCGG CAGCGGGTCC      180
      TACGAGGAGG GCTGTCAGAG CCTCATGGAG TACGCGTGGG GTAGAGCAGC GGCTGCCATG      240
      CTCTTCTGTG GCTTCATCAT CCTGGTGATC TGTTTCATCC TCTCCTTCTT CGCCCTCTGT      300
      GGACCCCAAG TGCTTGCTCTT CCTGAGAGTG ATTGGAGGTC TCCTTGCCCTT GGCTGCTGTG      360
      TTCCAGATCA TCTCCCTGGT AATTTACCCC GTGAAGTACA CCCAGACCTT CACCCTTCAT      420
10    GCCAACCGTG CTGTCACTTA CATCTATAAC TGGGCCTACG GCTTTGGGTG GGCAGCCACG      480
      ATTATCCTGA TCGGCTGTGC CTTCTCTTTC TGCTGCCTCC CCAACTACGA AGATGACCTT      540
      CTGGGCAATG CCAAGCCCAG GTACTTCTAC ACATCTGCC      579

```

15 (2) INFORMATION FOR SEQ ID NO: 37:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1502

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

20 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

25 (B) CELL KIND: Liver

(D) CLONE NAME: HP01263

(ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

30 (B) EXISTENCE POSITION: 37.. 1185

(C) CHARACTERIZATION METHOD: E

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

```

35  ACAAACGAC CCATCCTGGG CTTGTTCTC CACAGA ATG GGT CTG CTC CTT CCC      54
                                     Met Gly Leu Leu Leu Pro
                                     1           5
      CTG GCA CTC TGC ATC CTA GTC CTG TGC TGC GGA GCA ATG TCT CCA CCC      102

```

120

	Leu	Ala	Leu	Cys	Ile	Leu	Val	Leu	Cys	Cys	Gly	Ala	Met	Ser	Pro	Pro	
			10						15					20			
	CAG	CTG	GCC	CTC	AAC	CCC	TCG	GCT	CTG	CTC	TCC	CGG	GGC	TGC	AAT	GAC	150
	Gln	Leu	Ala	Leu	Asn	Pro	Ser	Ala	Leu	Leu	Ser	Arg	Gly	Cys	Asn	Asp	
5			25						30					35			
	TCC	GAT	GTG	CTG	GCA	GTT	GCA	GGC	TTT	GCC	CTG	CGG	GAT	ATT	AAC	AAA	198
	Ser	Asp	Val	Leu	Ala	Val	Ala	Gly	Phe	Ala	Leu	Arg	Asp	Ile	Asn	Lys	
			40						45					50			
	GAC	AGA	AAG	GAT	GGC	TAT	GTG	CTG	AGA	CTC	AAC	CGA	GTG	AAC	GAC	GCC	246
10	Asp	Arg	Lys	Asp	Gly	Tyr	Val	Leu	Arg	Leu	Asn	Arg	Val	Asn	Asp	Ala	
			55						60					65		70	
	CAG	GAA	TAC	AGA	CGG	GGT	GGC	CTG	GGA	TCT	CTG	TTC	TAT	CTT	ACA	CTG	294
	Gln	Glu	Tyr	Arg	Arg	Gly	Gly	Leu	Gly	Ser	Leu	Phe	Tyr	Leu	Thr	Leu	
						75					80				85		
15	GAT	GTG	CTA	GAG	ACT	GAC	TGC	CAT	GTG	CTC	AGA	AAG	AAG	GCA	TGG	CAA	342
	Asp	Val	Leu	Glu	Thr	Asp	Cys	His	Val	Leu	Arg	Lys	Lys	Ala	Trp	Gln	
						90					95				100		
	GAC	TGT	GGA	ATG	AGG	ATA	TTT	TTT	GAA	TCA	GTT	TAT	GGT	CAA	TGC	AAA	390
	Asp	Cys	Gly	Met	Arg	Ile	Phe	Phe	Glu	Ser	Val	Tyr	Gly	Gln	Cys	Lys	
20			105						110					115			
	GCA	ATA	TTT	TAT	ATG	AAC	AAC	CCA	AGT	AGA	GTT	CTC	TAT	TTA	GCT	GCT	438
	Ala	Ile	Phe	Tyr	Met	Asn	Asn	Pro	Ser	Arg	Val	Leu	Tyr	Leu	Ala	Ala	
						120			125					130			
	TAT	AAC	TGT	ACT	CTT	CGC	CCA	GTT	TCA	AAA	AAA	AAG	ATT	TAC	ATG	ACG	486
25	Tyr	Asn	Cys	Thr	Leu	Arg	Pro	Val	Ser	Lys	Lys	Lys	Ile	Tyr	Met	Thr	
						135			140				145		150		
	TGC	CCT	GAC	TGC	CCA	AGC	TCC	ATA	CCC	ACT	GAC	TCT	TCC	AAT	CAC	CAA	534
	Cys	Pro	Asp	Cys	Pro	Ser	Ser	Ile	Pro	Thr	Asp	Ser	Ser	Asn	His	Gln	
						155					160			165			
30	GTG	CTG	GAG	GCT	GCC	ACC	GAG	TCT	CTT	GCG	AAA	TAC	AAC	AAT	GAG	AAC	582
	Val	Leu	Glu	Ala	Ala	Thr	Glu	Ser	Leu	Ala	Lys	Tyr	Asn	Asn	Glu	Asn	
						170					175			180			
	ACA	TCC	AAG	CAG	TAT	TCT	CTC	TTC	AAA	GTC	ACC	AGG	GCT	TCT	AGC	CAG	630
	Thr	Ser	Lys	Gln	Tyr	Ser	Leu	Phe	Lys	Val	Thr	Arg	Ala	Ser	Ser	Gln	
35			185						190					195			
	TGG	GTG	GTC	GGC	CCT	TCT	TAC	TTT	GTG	GAA	TAC	TTA	ATT	AAA	GAA	TCA	678
	Trp	Val	Val	Gly	Pro	Ser	Tyr	Phe	Val	Glu	Tyr	Leu	Ile	Lys	Glu	Ser	
						200			205					210			

121

	CCA TGT ACT AAA TCC CAG GCC AGC AGC TGT TCA CTT CAG TCC TCC GAC	726
	Pro Cys Thr Lys Ser Gln Ala Ser Ser Cys Ser Leu Gln Ser Ser Asp	
	215 220 225 230	
	TCT GTG CCT GTT GGT CTT TGC AAA GGT TCT CTG ACT CGA ACA CAC TGG	774
5	Ser Val Pro Val Gly Leu Cys Lys Gly Ser Leu Thr Arg Thr His Trp	
	235 240 245	
	GAA AAG TTT GTC TCT GTG ACT TGT GAC TTC TTT GAA TCA CAG GCT CCA	822
	Glu Lys Phe Val Ser Val Thr Cys Asp Phe Phe Glu Ser Gln Ala Pro	
	250 255 260	
10	GCC ACT GGA AGT GAA AAC TCT GCT GTT AAC CAG AAA CCT ACA AAC CTT	870
	Ala Thr Gly Ser Glu Asn Ser Ala Val Asn Gln Lys Pro Thr Asn Leu	
	265 270 275	
	CCC AAG GTG GAA GAA TCC CAG CAG AAA AAC ACC CCC CCA ACA GAC TCC	918
	Pro Lys Val Glu Glu Ser Gln Gln Lys Asn Thr Pro Pro Thr Asp Ser	
15	280 285 290	
	CCC TCC AAA GCT GGG CCA AGA GGA TCT GTC CAA TAT CTT CCT GAC TTG	966
	Pro Ser Lys Ala Gly Pro Arg Gly Ser Val Gln Tyr Leu Pro Asp Leu	
	295 300 305 310	
	GAT GAT AAA AAT TCC CAG GAA AAG GGC CCT CAG GAG GCC TTT CCT GTG	1014
20	Asp Asp Lys Asn Ser Gln Glu Lys Gly Pro Gln Glu Ala Phe Pro Val	
	315 320 325	
	CAT CTG GAC CTA ACC ACG AAT CCC CAG GGA GAA ACC CTG GAT ATT TCC	1062
	His Leu Asp Leu Thr Thr Asn Pro Gln Gly Glu Thr Leu Asp Ile Ser	
	330 335 340	
25	TTC CTC TTC CTG GAG CCT ATG GAG GAG AAG CTG GTT GTC CTG CCT TTC	1110
	Phe Leu Phe Leu Glu Pro Met Glu Glu Lys Leu Val Val Leu Pro Phe	
	345 350 355	
	CCC AAA GAA AAA GCA CGC ACT GCT GAG TGC CCA GGG CCA GCC CAG AAT	1158
	Pro Lys Glu Lys Ala Arg Thr Ala Glu Cys Pro Gly Pro Ala Gln Asn	
30	360 365 370	
	GCC AGC CCT CTT GTC CTT CCG CCA TGAGAATCAC ACAGAGTCTT CTGTAGGG	1210
	Ala Ser Pro Leu Val Leu Pro Pro	
	375 380	
	GTATGGTGCG CCGCATGACA TGGGAGGCGA TGGGGACGAT GGACAGAGAC AGAGCGTGCA	1270
35	CACGTAGAGT GGCTAGTGAA GGACGCCTTT TTGACTCTTC TTGGTCTCAG CATGTTGACT	1330
	GGGATTGGAA ATAATGAGAC TGAGCCCTCG GCTTGGGCTG CACTCTACCC TGTACACTGC	1390
	CTTGTAACCT GAGCTGCATC ACCTCCTAAA CTGAGCAGTC TCATACCATG GAGAGATGCC	1450
	TCTCTTATGT CTTAGCCAC TCACTTATAA AGATACTTAT CTTTTCAGCA GT	1502

122

## (2) INFORMATION FOR SEQ ID NO: 38:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1349

5 (B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

## 10 (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Liver

(D) CLONE NAME: HP01299

15

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 111.. 1064

(C) CHARACTERIZATION METHOD: E

20

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

AGCAGTTGGG GCAGGAGGAA GCCGACTGCT GCCTGGTCTG CAAAGAAGTC CTTTCAAGTC 60  
TCTAGGACTG GACTCTTCCT AAGCAAGTCC GAGAAGGAAG CACCCTCACT ATG TGG 116  
25 Met Trp  
1  
CTC TAC CTG GCG GCC TTC GTG GGC CTG TAC TAC CTT CTG CAC TGG TAC  
164  
Leu Tyr Leu Ala Ala Phe Val Gly Leu Tyr Tyr Leu Leu His Trp Tyr  
30 5 10 15  
CGG GAG AGG CAG GTG GTG AGC CAC CTC CAA GAC AAG TAT GTC TTT ATC 212  
Arg Glu Arg Gln Val Val Ser His Leu Gln Asp Lys Tyr Val Phe Ile  
20 25 30  
ACG GGC TGT GAC TCG GGC TTT GGG AAC CTG CTG GCC AGA CAG CTG GAT 260  
35 Thr Gly Cys Asp Ser Gly Phe Gly Asn Leu Leu Ala Arg Gln Leu Asp  
35 40 45 50  
GCA CGA GGC TTG AGA GTG CTG GCT GCG TGT CTG ACG GAG AAG GGG GCC 308  
Ala Arg Gly Leu Arg Val Leu Ala Ala Cys Leu Thr Glu Lys Gly Ala

123																	
	55					60					65						
	GAG	CAG	CTG	AGG	GGC	CAG	ACG	TCT	GAC	AGG	CTG	GAG	ACG	GTG	ACC	CTG	356
	Glu	Gln	Leu	Arg	Gly	Gln	Thr	Ser	Asp	Arg	Leu	Glu	Thr	Val	Thr	Leu	
	70				75				80								
5	GAT	GTT	ACC	AAG	ATG	GAG	AGC	ATC	GCT	GCA	GCT	ACT	CAG	TGG	GTG	AAG	404
	Asp	Val	Thr	Lys	Met	Glu	Ser	Ile	Ala	Ala	Ala	Thr	Gln	Trp	Val	Lys	
	85				90				95								
	GAG	CAT	GTG	GGG	GAC	AGA	GGA	CTC	TGG	GGA	CTG	GTG	AAC	AAT	GCA	GGC	452
	Glu	His	Val	Gly	Asp	Arg	Gly	Leu	Trp	Gly	Leu	Val	Asn	Asn	Ala	Gly	
10	100				105				110								
	ATT	CTT	ACA	CCA	ATT	ACC	TTA	TGT	GAG	TGG	CTG	AAC	ACT	GAG	GAC	TCT	500
	Ile	Leu	Thr	Pro	Ile	Thr	Leu	Cys	Glu	Trp	Leu	Asn	Thr	Glu	Asp	Ser	
	115				120				125				130				
	ATG	AAT	ATG	CTC	AAA	GTG	AAC	CTC	ATT	GGT	GTG	ATC	CAG	GTG	ACC	TTG	548
15	Met	Asn	Met	Leu	Lys	Val	Asn	Leu	Ile	Gly	Val	Ile	Gln	Val	Thr	Leu	
	135				140				145								
	AGC	ATG	CTT	CCT	TTG	GTG	AGG	AGA	GCA	CGG	GGA	AGA	ATT	GTC	AAT	GTC	596
	Ser	Met	Leu	Pro	Leu	Val	Arg	Arg	Ala	Arg	Gly	Arg	Ile	Val	Asn	Val	
	150				155				160								
20	TCC	AGC	ATT	CTG	GGA	AGA	GTT	GCT	TTC	TTT	GTA	GGA	GGC	TAC	TGT	GTC	644
	Ser	Ser	Ile	Leu	Gly	Arg	Val	Ala	Phe	Phe	Val	Gly	Gly	Tyr	Cys	Val	
	165				170				175								
	TCC	AAG	TAT	GGA	GTG	GAA	GCC	TTT	TCA	GAT	ATT	CTG	AGG	CGT	GAG	ATT	692
	Ser	Lys	Tyr	Gly	Val	Glu	Ala	Phe	Ser	Asp	Ile	Leu	Arg	Arg	Glu	Ile	
25	180				185				190								
	CAA	CAT	TTT	GGG	GTG	AAA	ATC	AGC	ATA	GTT	GAA	CCT	GGC	TAC	TTC	AGA	740
	Gln	His	Phe	Gly	Val	Lys	Ile	Ser	Ile	Val	Glu	Pro	Gly	Tyr	Phe	Arg	
	195				200				205				210				
	ACG	GGA	ATG	ACA	AAC	ATG	ACA	CAG	TCC	TTA	GAG	CGA	ATG	AAG	CAA	AGT	788
30	Thr	Gly	Met	Thr	Asn	Met	Thr	Gln	Ser	Leu	Glu	Arg	Met	Lys	Gln	Ser	
	215				220				225								
	TGG	AAA	GAA	GCC	CCC	AAG	CAT	ATT	AAG	GAG	ACC	TAT	GGA	CAG	CAG	TAT	836
	Trp	Lys	Glu	Ala	Pro	Lys	His	Ile	Lys	Glu	Thr	Tyr	Gly	Gln	Gln	Tyr	
	230				235				240								
35	TTT	GAT	GCC	CTT	TAC	AAT	ATC	ATG	AAG	GAA	GGG	CTG	TTG	AAT	TGT	AGC	884
	Phe	Asp	Ala	Leu	Tyr	Asn	Ile	Met	Lys	Glu	Gly	Leu	Leu	Asn	Cys	Ser	
	245				250				255								
	ACA	AAC	CTG	AAC	CTG	GTC	ACT	GAC	TGC	ATG	GAA	CAT	GCT	CTG	ACA	TCG	932

124

Thr Asn Leu Asn Leu Val Thr Asp Cys Met Glu His Ala Leu Thr Ser  
 260 265 270  
 GTG CAT CCG CGA ACT CGA TAT TCA GCT GGC TGG GAT GCT AAA TTT TTC 980  
 Val His Pro Arg Thr Arg Tyr Ser Ala Gly Trp Asp Ala Lys Phe Phe  
 5 275 280 285 290  
 TTC ATC CCT CTA TCT TAT TTA CCT ACA TCA CTG GCA GAC TAC ATT TTG 1028  
 Phe Ile Pro Leu Ser Tyr Leu Pro Thr Ser Leu Ala Asp Tyr Ile Leu  
 295 300 305  
 ACT AGA TCT TGG CCC AAA CCA GCC CAG GCA GTC TAAAGAAAAC TGGGTTGGT 1080  
 10 Thr Arg Ser Trp Pro Lys Pro Ala Gln Ala Val  
 310 315  
 GCTTCTTGGA ATGAAGGCAA AAATCTGAAA TTGTTAGTGT CTCAGTAATC CTGATTTAGA 1140  
 ACCCAGGCTT TTTGTAACAA TGTGTTTTCT TGCCTAAATT CATTTATCTG GCATCATCAG 1200  
 AGTACTAACA TGTTTATATT TCAGATATCC AAAGCTTACC ACTTTAGGTG ATGAATCTTT 1260  
 15 ACTATTTTAG CCCTTTTTTG ATGAGACTAT TTGTCTAAAG TGAATCATTT GTTCTTGCCT 1320  
 TATTAAACAG AGTAGATGGA AAACAATTT 1349

## (2) INFORMATION FOR SEQ ID NO: 39:

- 20 (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 1643
  - (B) TYPE: Nucleic acid
  - (C) STRANDEDNESS: Double
  - (D) TOPOLOGY: Linear
- 25 (ii) SEQUENCE KIND: cDNA to mRNA
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: *Homo sapiens*
  - (B) CELL KIND: Liver
  - (D) CLONE NAME: HP01347
- 30
- (ix) SEQUENCE CHARACTERISTICS:
- (A) CHARACTERIZATION CODE: CDS
  - (B) EXISTENCE POSITION: 25.. 915
  - (C) CHARACTERIZATION METHOD: E
- 35
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

125

	AACATCTGGG GACAGCGGGA AAAC ATG AGT GAC TCC AAG GAA CCA AGG GTG	51
	Met Ser Asp Ser Lys Glu Pro Arg Val	
	1 5	
	CAG CAG CTG GGC CTC CTG GGG TGT CTT GGC CAT GGC GCC CTG GTG CTG	99
5	Gln Gln Leu Gly Leu Leu Gly Cys Leu Gly His Gly Ala Leu Val Leu	
	10 15 20 25	
	CAA CTC CTC TCC TTC ATG CTC TTG GCT GGG GTC CTG GTG GCC ATC CTT	147
	Gln Leu Leu Ser Phe Met Leu Leu Ala Gly Val Leu Val Ala Ile Leu	
	30 35 40	
10	GTC CAA GTG TCC AAG GTC CCC AGC TCC CTA AGT CAG GAA CAA TCC GAG	195
	Val Gln Val Ser Lys Val Pro Ser Ser Leu Ser Gln Glu Gln Ser Glu	
	45 50 55	
	CAA GAC GCA ATC TAC CAG AAC CTG ACC CAG CTT AAA GCT GCA GTG GGT	243
	Gln Asp Ala Ile Tyr Gln Asn Leu Thr Gln Leu Lys Ala Ala Val Gly	
15	60 65 70	
	GAG CTC TCA GAG AAA TCC AAG CTG CAG GAG ATC TAC CAG GAG CTG ACC	291
	Glu Leu Ser Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr	
	75 80 85	
	CAG CTG AAG GCT GCA GTG GGT GAG TTG CCA GAG AAA TCC AAG CTG CAG	339
20	Gln Leu Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln	
	90 95 100 105	
	GAG ATC TAC CAG GAG CTG ACC CGG CTG AAG GCT GCA GTG GGT GAG TTG	387
	Glu Ile Tyr Gln Glu Leu Thr Arg Leu Lys Ala-Ala Val Gly Glu Leu	
	110 115 120	
25	CCA GAG AAA TCC AAG CTG CAG GAG ATC TAC CAG GAG CTG ACC CGG CTG	435
	Pro Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr Arg Leu	
	125 130 135	
	AAG GCT GCA GTG GGT GAG TTG CCA GAG AAA TCC AAG CTG CAG GAG ATC	483
	Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln Glu Ile	
30	140 145 150	
	TAC CAG GAG CTG ACC CGG CTG AAG GCT GCA GTG GGT GAG TTG CCA GAG	531
	Tyr Gln Glu Leu Thr Arg Leu Lys Ala Ala Val Gly Glu Leu Pro Glu	
	155 160 165	
	AAA TCC AAG CTG CAG GAG ATC TAC CAG GAG CTG ACG GAG CTG AAG GCT	579
35	Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr Glu Leu Lys Ala	
	170 175 180 185	
	GCA GTG GGT GAG TTG CCA GAG AAA TCC AAG CTG CAG GAG ATC TAC CAG	627
	Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln	

126

	190	195	200	
	GAG CTG ACC CAG CTG AAG GCT GCA GTG GGT GAG TTG CCA GAC CAG TCC	675		
	Glu Leu Thr Gln Leu Lys Ala Ala Val Gly Glu Leu Pro Asp Gln Ser			
	205	210	215	
5	AAG CAG CAG CAA ATC TAT CAA GAA CTG ACC GAT TTG AAG ACT GCA TTT	723		
	Lys Gln Gln Gln Ile Tyr Gln Glu Leu Thr Asp Leu Lys Thr Ala Phe			
	220	225	230	
	GAA CGC CTG TGC CGC CAC TGT CCC AAG GAC TGG ACA TTC TTC CAA GGA	771		
	Glu Arg Leu Cys Arg His Cys Pro Lys Asp Trp Thr Phe Phe Gln Gly			
10	235	240	245	
	AAC TGT TAC TTC ATG TCT AAC TCC CAG CGG AAC TGG CAC GAC TCC GTC	819		
	Asn Cys Tyr Phe Met Ser Asn Ser Gln Arg Asn Trp His Asp Ser Val			
	250	255	260	265
	ACC GCC TGC CAG GAA GTG AGG GCC CAG CTC GTC GTA ATC AAA ACT GCT	867		
15	Thr Ala Cys Gln Glu Val Arg Ala Gln Leu Val Val Ile Lys Thr Ala			
	270	275	280	
	GAG GAG CAG CTT CCA GCG GTA CTG GAA CAG TGG AGA ACC CAA CAA	912		
	Glu Glu Gln Leu Pro Ala Val Leu Glu Gln Trp Arg Thr Gln Gln			
	285	290	295	
20	TAGCGGGAAT GAAGACTGTG CGGAATTTAG TGGCAGTGGC TGGAACGACA ATCGATGT	970		
	GACGTTGACA ATTACTGGAT CTGCAAAAAG CCCGCAGCCT GCTTCAGAGA CGAATAGTTG	1030		
	TTTCCCTGCT AGCCTCAGCC TCCATTGTGG TATAGCAGAA CTTCAACCCAC TTGTAAGCCA	1090		
	GCGCTTCTTC TCTCCATCCT TGGACCTTCA CAAATGCCCT GAGACGGTTC TCTGTTGAT	1150		
	TTTTATCCC CTATGAACCT GGGTCTTATT CTGTCCTTCT GATGCCTCCA AGTTTCCCTG	1210		
25	GTGTAGAGCT TGTGTTCTTG GCCCATCCTT GGAGCTTTAT AAGTGACCTG AGTGGGATGC	1270		
	ATTTAGGGGG CGGGCTTGGT ATGTTGTATG AATCCACTCT CTGTTCTTTT TGGAGATTAG	1330		
	ACTATTTGGA TTCATGTGTA GCTGCCCTGT CCCCTGGGGC TTTATCTCAT CCATGCAAAC	1390		
	TACCATCTGC TCAACTTCCA GCTACACCCC GTGCACCCTT TTGACTGGGG ACTTGCTGGT	1450		
	TGAAGGAGCT CATCTTGCA GCTGGAAGCA CCAGGGAATT AATTCCCCCA GTCAACCAAT	1510		
30	GGCATCCAGA GAGGGCATGG AGGCTCCATA CAACCTCTTC CACCCCCACA TCTTTCTTTG	1570		
	TCCTATACAT GTCTTCCATT TGGCTGTTTC TGAGTTGTAG CCTTTATAAT AAAGTGGTAA	1630		
	ATGTTGTAAC TGC	1643		

35 (2) INFORMATION FOR SEQ ID NO: 40:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 729

(B) TYPE: Nucleic acid



127

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

5 (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP01440

10 (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 38.. 631

(C) CHARACTERIZATION METHOD: E

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

```

ACTTTCAC TC ACCGCCTG TC CTCCTGAC CCTCACC ATG TGT ACG GGA AAA TGT      55
                                     Met Cys Thr Gly Lys Cys
                                     1           5
20 GCC CGC TGT GTG GGG CTC TCC CTC ATT ACC CTC TGC CTC GTC TGC ATT      103
   Ala Arg Cys Val Gly Leu Ser Leu Ile Thr Leu Cys Leu Val Cys Ile
       10           15           20
   GTG GCC AAC GCC CTC CTG CTG GTA CCT AAT GGG GAG ACC TCC TGG ACC      151
   Val Ala Asn Ala Leu Leu Leu Val Pro Asn Gly Glu Thr Ser Trp Thr
25       25           30           35
   AAC ACC AAC CAT CTC AGC TTG CAA GTC TGG CTC ATG GGC GGC TTC ATT      199
   Asn Thr Asn His Leu Ser Leu Gln Val Trp Leu Met Gly Gly Phe Ile
       40           45           50
   GGC GGC GGC CTA ATG GTA CTG TGT CCG GGG ATT GCA GCC GTT CGG GCA      247
30 Gly Gly Gly Leu Met Val Leu Cys Pro Gly Ile Ala Ala Val Arg Ala
   55           60           65           70
   GGG GGC AAG GGC TGC TGT GGT GCT GGG TGC TGT GGA AAC CGC TGC AGG      295
   Gly Gly Lys Gly Cys Cys Gly Ala Gly Cys Cys Gly Asn Arg Cys Arg
       75           80           85
35 ATG CTG CGC TCG GTC TTC TCC TCG GCG TTC GGG GTG CTT GGT GCC ATC      343
   Met Leu Arg Ser Val Phe Ser Ser Ala Phe Gly Val Leu Gly Ala Ile
       90           95           100
   TAC TGC CTC TCG GTG TCT GGA GCT GGG CTC CGA AAT GGA CCC AGA TGC      391

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128

Tyr Cys Leu Ser Val Ser Gly Ala Gly Leu Arg Asn Gly Pro Arg Cys  
 105 110 115  
 TTA ATG AAC GGC GAG TGG GGC TAC CAC TTC GAA GAC ACC GCG GGA GCT 439  
 Leu Met Asn Gly Glu Trp Gly Tyr His Phe Glu Asp Thr Ala Gly Ala  
 5 120 125 130  
 TAC TTG CTC AAC CGC ACT CTA TGG GAT CGG TGC GAG GCG CCC CCT CGC 487  
 Tyr Leu Leu Asn Arg Thr Leu Trp Asp Arg Cys Glu Ala Pro Pro Arg  
 135 140 145 150  
 GTG GTC CCC TGG AAT GTG ACG CTC TTC TCG CTG CTG GTG GCC GCC TCC 535  
 10 Val Val Pro Trp Asn Val Thr Leu Phe Ser Leu Leu Val Ala Ala Ser  
 155 160 165  
 TGC CTG GAG ATA GTA CTG TGT GGG ATC CAG CTG GTG AAC GCG ACC ATT 583  
 Cys Leu Glu Ile Val Leu Cys Gly Ile Gln Leu Val Asn Ala Thr Ile  
 170 175 180  
 15 GGT GTC TTC TGC GGC GAT TGC AGG AAA AAA CAG GAC ACC CCT CAC TG 630  
 Gly Val Phe Cys Gly Asp Cys Arg Lys Lys Gln Asp Thr Pro His  
 185 190 195  
 AGGCTCCACT GACCGCCGGG TTACACCTGC TCCTTCCTGG ACGCCTACCT GGCTCGCTCA 690  
 CTCCCTTGCT CGCTAGAATA AACTGCTTTG CGCTCTCTT 729  
 20

## (2) INFORMATION FOR SEQ ID NO: 41:

## (i) SEQUENCE CHARACTERISTICS:

- 25 (A) LENGTH: 1322  
 (B) TYPE: Nucleic acid  
 (C) STRANDEDNESS: Double  
 (D) TOPOLOGY: Linear  
 (ii) SEQUENCE KIND: cDNA to mRNA

## 30 (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP01526

## 35 (ix) SEQUENCE CHARACTERISTICS:

- (A) CHARACTERIZATION CODE: CDS  
 (B) EXISTENCE POSITION: 84.. 749  
 (C) CHARACTERIZATION METHOD: E

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

	GAGCCGCAGG TCTGGGCTGC AGTAGGTCCC GGCAACCGCA GGCTCGCGGC GGGCGCTGGG	60
	CGCGGGATCC GACTCTAGTC GTA ATG GAG GCG GGC GGC TTT CTG GAC TCG CTC	113
5	Met Glu Ala Gly Gly Phe Leu Asp Ser Leu	
	1 5 10	
	ATT TAC GGA GCA TGC GTG GTC TTC ACC CTT GGC ATG TTC TCC GCC GGC	161
	Ile Tyr Gly Ala Cys Val Val Phe Thr Leu Gly Met Phe Ser Ala Gly	
	15 20 25	
10	CTC TCG GAC CTC AGG CAC ATG CGA ATG ACC CGG AGT GTG GAC AAC GTC	209
	Leu Ser Asp Leu Arg His Met Arg Met Thr Arg Ser Val Asp Asn Val	
	30 35 40	
	CAG TTC CTG CCC TTT CTC ACC ACG GAA GTC AAC AAC CTG GGC TGG CTG	257
	Gln Phe Leu Pro Phe Leu Thr Thr Glu Val Asn Asn Leu Gly Trp Leu	
15	45 50 55	
	AGT TAT GGG GCT TTG AAG GGA GAC GGG ATC CTC ATC GTC GTC AAC ACA	305
	Ser Tyr Gly Ala Leu Lys Gly Asp Gly Ile Leu Ile Val Val Asn Thr	
	60 65 70	
	GTG GGT GCT GCG CTT CAG ACC CTG TAT ATC TTG GCA TAT CTG CAT TAC	353
20	Val Gly Ala Ala Leu Gln Thr Leu Tyr Ile Leu Ala Tyr Leu His Tyr	
	75 80 85 90	
	TGC CCT CGG AAG CGT GTT GTG CTC CTA CAG ACT GCA ACC CTG CTA GGG	401
	Cys Pro Arg Lys Arg Val Val Leu Leu Gln Thr Ala Thr Leu Leu Gly	
	95 100 105	
25	GTC CTT CTC CTG GGT TAT GGC TAC TTT TGG CTC CTG GTA CCC AAC CCT	449
	Val Leu Leu Leu Gly Tyr Gly Tyr Phe Trp Leu Leu Val Pro Asn Pro	
	110 115 120	
	GAG GCC CGG CTT CAG CAG TTG GGC CTC TTC TGC AGT GTC TTC ACC ATC	497
	Glu Ala Arg Leu Gln Gln Leu Gly Leu Phe Cys Ser Val Phe Thr Ile	
30	125 130 135	
	AGC ATG TAC CTC TCA CCA CTG GCT GAC TTG GCT AAG GTG ATT CAA ACT	545
	Ser Met Tyr Leu Ser Pro Leu Ala Asp Leu Ala Lys Val Ile Gln Thr	
	140 145 150	
	AAA TCA ACC CAA TGT CTC TCC TAC CCA CTC ACC ATT GCT ACC CTT CTC	593
35	Lys Ser Thr Gln Cys Leu Ser Tyr Pro Leu Thr Ile Ala Thr Leu Leu	
	155 160 165 170	
	ACC TCT GCC TCC TGG TGC CTC TAT GGG TTT CGA CTC AGA GAT CCC TAT	641
	Thr Ser Ala Ser Trp Cys Leu Tyr Gly Phe Arg Leu Arg Asp Pro Tyr	

130

	175	180	185	
	ATC ATG GTG TCC AAC TTT CCA GGA ATC GTC ACC AGC TTT ATC CGC TTC			689
	Ile Met Val Ser Asn Phe Pro Gly Ile Val Thr Ser Phe Ile Arg Phe			
	190	195	200	
5	TGG CTT TTC TGG AAG TAC CCC CAG GAG CAA GAC AGG AAC TAC TGG CTC			737
	Trp Leu Phe Trp Lys Tyr Pro Gln Glu Gln Asp Arg Asn Tyr Trp Leu			
	205	210	215	
	CTG CAA ACC TGAGGCTGCT CATCTGACCA CTGGGCACCT TAGTGCCAAC CTGA			790
	Leu Gln Thr			
10	220			
	ACCAAAGAGA CCTCCTTGTT TCAGCTGGGC CTGCTGTCCA GCTTCCCAGG TGCAGTGGGT			850
	TGTGGGAACA AGAGATGACT TTGAGGATAA AAGGACCAAA GAAAAAGCTT TACTTAGATG			910
	ATTGATTGGG GCCTAGGAGA TGAAATCACT TTTTATTTTT TAGAGATTTT TTTTTTTAAT			970
	TTTGGAGGTT GGGGTGCAAT CTTTGAATA TGCCTTAAAA GGCCGGGCGC GGTGGCTCAC			1030
15	GCCTGTAATC CCAGCACTTT GGGAGGCCAA GGTGGGCGGA TCGCCTGAGG TCAGGAGTTC			1090
	AAGACCAACC TGACTAACAT GGTGAAACCC CATCTCTACT AAAAATACAA AATTAGCCAG			1150
	GCATGATGGC ACATGCCTGT AATCCAGAT ACTTGGGAGG CTGAGGCAGG AGAATTGCTT			1210
	GAACCCAGGA GGTGGAGGTT GCAGTGAGCT GAGATCGTGC CATTGTGATA TGAATATGCC			1270
	TTATATGCTG ATATGAATAT GCCTTAAAT AAAGTGTTCC CCACCCCTGC CC			1322

- (2) INFORMATION FOR SEQ ID NO: 42:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 3045
- (B) TYPE: Nucleic acid
- (C) STRANDEDNESS: Double
- (D) TOPOLOGY: Linear
- (ii) SEQUENCE KIND: cDNA to mRNA
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: *Homo sapiens*
- (B) CELL KIND: Stomach cancer
- (D) CLONE NAME: HP10230
- (ix) SEQUENCE CHARACTERISTICS:
- (A) CHARACTERIZATION CODE: CDS
- (B) EXISTENCE POSITION: 191.. 946
- (C) CHARACTERIZATION METHOD: E

131

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 42:

	GTTTCGCCTC AGAAGGCTGC CTCGCTGGTC CGAATTCGGT GCGCCACGT CCGCCGTCT	60
	CCGCCTTCTG CATCGCGGCT TCGGCGGCTT CCACCTAGAC ACCTAACAGT CGCGGAGCCG	120
5	GCCGCGTCGT GAGGGGGTCG GCACGGGAG TCGGCGGTC TTGTGCATCT TGGCTACCTG	180
	TGGGTCAAG ATG TCG GAC ATC GGA GAC TGG TTC AGG AGC ATC CCG GCG	229
	Met Ser Asp Ile Gly Asp Trp Phe Arg Ser Ile Pro Ala	
	1 5 10	
	ATC ACG CGC TAT TGG TTC GCC GCC ACC GTC GCC GTG CCC TTG GTC GGC	277
10	Ile Thr Arg Tyr Trp Phe Ala Ala Thr Val Ala Val Pro Leu Val Gly	
	15 20 25	
	AAA CTC GGC CTC ATC AGC CCG GCC TAC CTC TTC CTC TGG CCC GAA GCC	325
	Lys Leu Gly Leu Ile Ser Pro Ala Tyr Leu Phe Leu Trp Pro Glu Ala	
	30 35 40 45	
15	TTC CTT TAT CGC TTT CAG ATT TGG AGG CCA ATC ACT GCC ACC TTT TAT	373
	Phe Leu Tyr Arg Phe Gln Ile Trp Arg Pro Ile Thr Ala Thr Phe Tyr	
	50 55 60	
	TTC CCT GTG GGT CCA GGA ACT GGA TTT CTT TAT TTG GTC AAT TTA TAT	421
	Phe Pro Val Gly Pro Gly Thr Gly Phe Leu Tyr Leu Val Asn Leu Tyr	
20	65 70 75	
	TTC TTA TAT CAG TAT TCT ACG CGA CTT GAA ACA GGA GCT TTT GAT GGG	469
	Phe Leu Tyr Gln Tyr Ser Thr Arg Leu Glu Thr Gly Ala Phe Asp Gly	
	80 85 90	
	AGG CCA GCA GAC TAT TTA TTC ATG CTC CTC TTT AAC TGG ATT TGC ATC	517
25	Arg Pro Ala Asp Tyr Leu Phe Met Leu Leu Phe Asn Trp Ile Cys Ile	
	95 100 105	
	GTG ATT ACT GGC TTA GCA ATG GAT ATG CAG TTG CTG ATG ATT CCT CTG	565
	Val Ile Thr Gly Leu Ala Met Asp Met Gln Leu Leu Met Ile Pro Leu	
	110 115 120 125	
30	ATC ATG TCA GTA CTT TAT GTC TGG GCC CAG CTG AAC AGA GAC ATG ATT	613
	Ile Met Ser Val Leu Tyr Val Trp Ala Gln Leu Asn Arg Asp Met Ile	
	130 135 140	
	GTA TCA TTT TGG TTT GGA ACA CGA TTT AAG GCC TGC TAT TTA CCC TGG	661
	Val Ser Phe Trp Phe Gly Thr Arg Phe Lys Ala Cys Tyr Leu Pro Trp	
35	145 150 155	
	GTT ATC CTT GGA TTC AAC TAT ATC ATC GGA GGC TCG GTA ATC AAT GAG	709
	Val Ile Leu Gly Phe Asn Tyr Ile Ile Gly Gly Ser Val Ile Asn Glu	
	160 165 170	

132

	CTT ATT GGA AAT CTG GTT GGA CAT CTT TAT TTT TTC CTA ATG TTC AGA	757
	Leu Ile Gly Asn Leu Val Gly His Leu Tyr Phe Phe Leu Met Phe Arg	
	175 180 185	
	TAC CCA ATG GAC TTG GGA GGA AGA AAT TTT CTA TCC ACA CCT CAG TTT	805
5	Tyr Pro Met Asp Leu Gly Gly Arg Asn Phe Leu Ser Thr Pro Gln Phe	
	190 195 200 205	
	TTG TAC CGC TGG CTG CCC AGT AGG AGA GGA GGA GTA TCA GGA TTT GGT	853
	Leu Tyr Arg Trp Leu Pro Ser Arg Arg Gly Gly Val Ser Gly Phe Gly	
	210 215 220	
10	GTG CCC CCT GCT AGC ATG AGG CGA GCT GCT GAT CAG AAT GGC GGA GGC	901
	Val Pro Pro Ala Ser Met Arg Arg Ala Ala Asp Gln Asn Gly Gly Gly	
	225 230 235	
	GGG AGA CAC AAC TGG GGC CAG GGC TTT CGA CTT GGA GAC CAG TGAAGGG	950
	Gly Arg His Asn Trp Gly Gln Gly Phe Arg Leu Gly Asp Gln	
15	240 245 250	
	GCGGCCTCGG GCAGCCGCTC CTCTCAAGCC ACATTTCTCTC CCAGTGCTGG GTGCGCTTAA	1010
	CAACTGCGTT CTGGCTAACA CTGTTGGACC TGACCCACAC TGAATGTAGT CTTTCAGTAC	1070
	GAGACAAAGT TTCTTAAATC CCGAAGAAAA ATATAAGTGT TCCACAAGTT TCACGATTCT	1130
	CATTCAAGTC CTTACTGCTG TGAAGAACAA ATACCAACTG TGCAAATTGC AAAACTGACT	1190
20	ACATTTTTTG GTGTCTTCTC TTCTCCCCTT TCCGTCTGAA TAATGGGTTT TAGCGGGTCC	1250
	TAGTCTGCTG GCATTGAGCT GGGGCTGGGT CACCAAACCC TTCCCAAAAG GACCCTTATC	1310
	TCTTTCTTGC ACACATGCCT CTCTCCCCTT TTTCCCAACC CCCACATTTG CAACTAGAAG	1370
	AGGTTGCCCA TAAAAATTGCT CTGCCCTTGA CAGGTTCTGT TATTTATTGA CTTTTGCCAA	1430
	GGCTTGGTCA CAACAATCAT ATTACGTAA TTTTCCCCCT TTGGTGGCAG AACTGTAGCA	1490
25	ATAGGGGGAG AAGACAAGCA GCGGATGAAG CGTTTTCTCA GCTTTTGGA TTGCTTCGAC	1550
	CTGACATCCG TTGTAACCGT TTGCCACTTC TTCAGATATT TTTATAAAAA AGTACCACTG	1610
	AGTCAGTGAG GGCCACAGAT TGGTATTAAT GAGATACGAG GGTGTTGCT GGGTGTGTT	1670
	TTCTGAGCT AAGTGATCAA GACTGTAGTG GAGTTGCAGC TAACATGGGT TAGGTTTAAA	1730
	CCGTGGGGGA TGCAACCCCT TTGCGTTTCA TATGTAGGCC TACTGGCTTT GTGTAGCTGG	1790
30	AGTAGTTGGG TTGCTTTGTG TTAGGAGGAT CCAGATCATG TTGGCTACAG GGAGATGCTC	1850
	TCTTTGAGAG GCTCCTGGGC ATTGATTCCA TTTCAATCTC ATTCTGGATA TGTGTTTATT	1910
	GAGTAAAGGA GGAGAGACCC TCATACGCTA TTAAATGTC ACTTTTTTGC CTATCCCCCG	1970
	TTTTTTGGTC ATGTTTCAAT TAATTGTGAG GAAGGCGCAG CTCCTCTCTG CACGTAGATC	2030
	ATTTTTTAAA GCTAATGTAA GCACATCTAA GGAATAACA TGATTTAAGG TTGAAATGGC	2090
35	TTTAGAATCA TTTGGGTTT AGGGTGTGTT ATTTTGAGTC ATGAATGTAC AAGCTCTGTG	2150
	AATCAGACCA GCTTAAATAC CCACACCTTT TTTTCGTAGG TGGGCTTTTC CTATCAGAGC	2210
	TTGGCTCATA ACCAAATAAA GTTTTTTGAA GGCCATGGCT TTTCACACAG TTATTTTATT	2270
	TTATGACGTT ATCTGAAAGC AGACTGTTAG GAGCAGTATT GAGTGGCTGT CACACTTTGA	2330

133

GGCAACTAAA AAGGCTTCAA ACGTTTTGAT CAGTTTCTTT TCAGGAAACA TTGTGCTCTA 2390  
 ACAGTATGAC TATTCTTTCC CCCACTCTTA AACAGTGTGA TGTGTGTTAT CCTAGGAAAT 2450  
 GAGAGTTGGC AAACAACTTC TCATTTTGAA TAGAGTTTGT GTGTACCTCT CCATATTTAA 2510  
 TTTATATGAT AAAATAGGTG GGGAGAGTCT GAACCTTAAC TGTCATGTTT TGTGTTTCAT 2570  
 5 CTGTGGCCAC AATAAAGTTT ACTTGTAATA TTTTAGAGGC CATTACTCCA ATTATGTTGC 2630  
 ACGTACACTC ATTGTACAGG CGTGGAGACT CATTGTATGT ATAAGAATAT TCTGACAGTG 2690  
 AGTGACCCGG AGTCTCTGGT GTACCCTCTT ACCAGTCAGC TGCCTGCGAG CAGTCATTTT 2750  
 TTCCTAAAGG TTTACAAGTA TTTAGAACTC TTCAGTTCAG GGCAAAATGT TCATGAAGTT 2810  
 ATTCCTCTTA AACATGGTTA GGAAGCTGAT GACGTTATTG ATTTTGTCTG GATTATGTTT 2870  
 10 CTGGAATAAT TTTACCAAAA CAAGCTATTT GAGTTTTGAC TTGACAAGGC AAAACATGAC 2930  
 AGTGGATTCT CTTTACAAAT TGAACAAAAA AATCCTTATT TTGTATAAAG GACTTCCCTT 2990  
 TTTGTAAACT AATCCTTTTT ATTGCTAAAA ATTGTAAATT AAAATGTGCA ACTTG 3045

15 (2) INFORMATION FOR SEQ ID NO: 43:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 653

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

20 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

25 (B) CELL KIND: Epidermoid carcinoma

(C) CELL LINE: KB

(D) CLONE NAME: HP10389

(ix) SEQUENCE CHARACTERISTICS:

30 (A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 63.. 383

(C) CHARACTERIZATION METHOD: E

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 43:

35

ATGACCTTCA CCGGGAGGCT GAGGTCGGAG TCCCGATTTT CTCCTGCTGC TGTGGCCCGG 60  
 AC ATG GCG ACT CCC GGC CCT GTG ATT CCG GAG GTC CCC TTT GAA CCA 107  
 Met Ala Thr Pro Gly Pro Val Ile Pro Glu Val Pro Phe Glu Pro

134

	1	5	10	15	
	TCG AAG CCT CCA GTC ATT GAG GGG CTG AGC CCC ACT GTT TAC AGG AAT	155			
	Ser Lys Pro Pro Val Ile Glu Gly Leu Ser Pro Thr Val Tyr Arg Asn				
	20	25	30		
5	CCA GAG AGT TTC AAG GAA AAG TTC GTT CGC AAG ACC CGC GAG AAC CCG	203			
	Pro Glu Ser Phe Lys Glu Lys Phe Val Arg Lys Thr Arg Glu Asn Pro				
	35	40	45		
	GTG GTA CCC ATA GGT TGC CTG GCC ACG GCG GCC GCC CTC ACC TAC GGC	251			
	Val Val Pro Ile Gly Cys Leu Ala Thr Ala Ala Ala Leu Thr Tyr Gly				
10	50	55	60		
	CTC TAC TCC TTC CAC CGG GGC AAC AGC CAG CGC TCT CAG CTC ATG ATG	299			
	Leu Tyr Ser Phe His Arg Gly Asn Ser Gln Arg Ser Gln Leu Met Met				
	65	70	75		
	CGC ACC CGG ATC GCC GCC CAG GGT TTC ACG GTC GCA GCC ATC TTG CTG	347			
15	Arg Thr Arg Ile Ala Ala Gln Gly Phe Thr Val Ala Ala Ile Leu Leu				
	80	85	90	95	
	GGT CTG GCT GTC ACT GCT ATG AAG TCT CGA CCC TAAGCCCAGG GTCTGGCCTT	400			
	Gly Leu Ala Val Thr Ala Met Lys Ser Arg Pro				
	100	105			
20	GAAAGCTCCG CAGAAATGAT TCCAAAACCC AGGGAGCAAC CACTGGCCCT ACCGTGGGAC	460			
	TTACTCCCTC CTCTCCTTG AGAGGCCCAT GTGTCGCTGG GGAGGAAGTG ACCCTTTGTG	520			
	TAACTGTAAC CGAAAGTTTT TTCAAAAATC CTAGATGCTG TTGTTTGAAT GTTACATACT	580			
	TCTATTTGTG CCACATCTCC CCTCCACTCC CCTGCTTAAT AAACCTCTAAA AATCCACTTG	640			
	TATTTAATTC AGT	653			
25					

## (2) INFORMATION FOR SEQ ID NO: 44:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 439

30

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

35

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10408



135

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 75.. 311

(C) CHARACTERIZATION METHOD: E

5

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 44:

GTAGAAACAG GCCTGTTAAG GAGAGGCCAC CGGGA CTTCATCATCCCAGGA 60  
 GCGCAGTGGC CACT ATG GGG TCT GGG CTG CCC CTT GTC CTC CTC TTG ACC 110  
 10 Met Gly Ser Gly Leu Pro Leu Val Leu Leu Leu Thr  
                   1                  5                  10  
 CTC CTT GGC AGC TCA CAT GGA ACA GGG CCG GGT ATG ACT TTG CAA CTG 158  
 Leu Leu Gly Ser Ser His Gly Thr Gly Pro Gly Met Thr Leu Gln Leu  
                   15                  20                  25  
 15 AAG CTG AAG GAG TCT TTT CTG ACA AAT TCC TCC TAT GAG TCC AGC TTC 206  
 Lys Leu Lys Glu Ser Phe Leu Thr Asn Ser Ser Tyr Glu Ser Ser Phe  
                   30                  35                  40  
 CTG GAA TTG CTT GAA AAG CTC TGC CTC CTC CTC CAT CTC CCT TCA GGG 254  
 Leu Glu Leu Leu Glu Lys Leu Cys Leu Leu Leu His Leu Pro Ser Gly  
 20 45                  50                  55                  60  
 ACC AGC GTC ACC CTC CAC CAT GCA AGA TCT CAA CAC CAT GTT GTC TGC 302  
 Thr Ser Val Thr Leu His His Ala Arg Ser Gln His His Val Val Cys  
                   65                  70                  75  
 AAC ACA TGACAGCCAT TGAAGCCTGT GTCCTTCTTG GCCCGGGCTT TTGGGCCGGG GA 360  
 25 Asn Thr  
  
 TGCAGGAGGC AGGCCCCGAC CCTGTCTTTC AGCAGGCCCC CACCCTCCTG AGTGGCAATA 420  
 AATAAAATTC GGTATGCTG 439

30

## (2) INFORMATION FOR SEQ ID NO: 45:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1131

(B) TYPE: Nucleic acid

35

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

136

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10412

5

## (ix) SEQUENCE CHARACTERISTICS:

- (A) CHARACTERIZATION CODE: CDS  
 (B) EXISTENCE POSITION: 56.. 1000  
 (C) CHARACTERIZATION METHOD: E

10

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 45:

	CTATGAGATC CCGGCCTCAG GGTGGACGCA GTGGTTCTGC ACTGAGGCC TCCTC ATG	58
		Met
15		1
	GTG GCG CCT GTG TGG TAC TTG GTA GCG GCG GCT CTG CTA GTC GGC TTT	106
	Val Ala Pro Val Trp Tyr Leu Val Ala Ala Ala Leu Leu Val Gly Phe	
	5 10 15	
	ATC CTC TTC CTG ACT CGC AGC CGG GGC CGG GCG GCA TCA GCC GGC CAA	154
20	Ile Leu Phe Leu Thr Arg Ser Arg Gly Arg Ala Ala Ser Ala Gly Gln	
	20 25 30	
	GAG CCA CTG CAC AAT GAG GAG CTG GCA GGA GCA GGC CGG GTG GCC CAG	202
	Glu Pro Leu His Asn Glu Glu Leu Ala Gly Ala Gly Arg Val Ala Gln	
	35 40 45	
25	CCT GGG CCC CTG GAG CCT GAG GAG CCG AGA GCT GGA GGC AGG CCT CGG	250
	Pro Gly Pro Leu Glu Pro Glu Glu Pro Arg Ala Gly Gly Arg Pro Arg	
	50 55 60 65	
	CGC CGG AGG GAC CTG GGC AGC CGC CTA CAG GCC CAG CGT CGA GCC CAG	298
	Arg Arg Arg Asp Leu Gly Ser Arg Leu Gln Ala Gln Arg Arg Ala Gln	
30	70 75 80	
	CGG GTG GCC TGG GCA GAA GCA GAT GAG AAC GAG GAG GAA GCT GTC ATC	346
	Arg Val Ala Trp Ala Glu Ala Asp Glu Asn Glu Glu Glu Ala Val Ile	
	85 90 95	
	CTA GCC CAG GAG GAG GAA GGT GTC GAG AAG CCA GCG GAA ACT CAC CTG	394
35	Leu Ala Gln Glu Glu Glu Gly Val Glu Lys Pro Ala Glu Thr His Leu	
	100 105 110	
	TCG GGG AAA ATT GGA GCT AAG AAA CTG CGG AAG CTG GAG GAG AAA CAA	442
	Ser Gly Lys Ile Gly Ala Lys Lys Leu Arg Lys Leu Glu Glu Lys Gln	

137

	115	120	125	
	GCG CGA AAG GCC CAG CGT GAG GCA GAG GAG GCT GAA CGT GAG GAG CGG			490
	Ala Arg Lys Ala Gln Arg Glu Ala Glu Glu Ala Glu Arg Glu Glu Arg			
	130	135	140	145
5	AAA CGA CTC GAG TCC CAG CGC GAA GCT GAG TGG AAG AAG GAG GAG GAG			538
	Lys Arg Leu Glu Ser Gln Arg Glu Ala Glu Trp Lys Lys Glu Glu Glu			
	150	155	160	
	CGG CTT CGC CTG GAG GAG GAG CAG AAG GAG GAG GAG GAG AGG AAG GCC			586
	Arg Leu Arg Leu Glu Glu Glu Gln Lys Glu Glu Glu Glu Arg Lys Ala			
10	165	170	175	
	CGC GAG GAG CAG GCC CAG CGG GAG CAT GAG GAG TAC CTG AAA CTG AAG			634
	Arg Glu Glu Gln Ala Gln Arg Glu His Glu Glu Tyr Leu Lys Leu Lys			
	180	185	190	
	GAG GCC TTT GTG GTG GAG GAG GAA GGC GTA GGA GAG ACC ATG ACT GAG			682
15	Glu Ala Phe Val Val Glu Glu Glu Gly Val Gly Glu Thr Met Thr Glu			
	195	200	205	
	GAA CAG TCC CAG AGC TTC CTG ACA GAG TTC ATC AAC TAC ATC AAG CAG			730
	Glu Gln Ser Gln Ser Phe Leu Thr Glu Phe Ile Asn Tyr Ile Lys Gln			
	210	215	220	225
20	TCC AAG GTT GTG CTC TTG GAA GAC CTG GCT TCC CAG GTG GGC CTA CGC			778
	Ser Lys Val Val Leu Leu Glu Asp Leu Ala Ser Gln Val Gly Leu Arg			
	230	235	240	
	ACT CAG GAC ACC ATA AAT CGC ATC CAG GAC CTG CTG GCT GAG GGG ACT			826
	Thr Gln Asp Thr Ile Asn Arg Ile Gln Asp Leu Leu Ala Glu Gly Thr			
25	245	250	255	
	ATA ACA GGT GTG ATT GAC GAC CGG GGC AAG TTC ATC TAC ATA ACC CCA			874
	Ile Thr Gly Val Ile Asp Asp Arg Gly Lys Phe Ile Tyr Ile Thr Pro			
	260	265	270	
	GAG GAA CTG GCC GCC GTG GCC AAC TTC ATC CGA CAG CGG GGC CGG GTG			922
30	Glu Glu Leu Ala Ala Val Ala Asn Phe Ile Arg Gln Arg Gly Arg Val			
	275	280	285	
	TCC ATC GCC GAG CTT GCC CAA GCC AGC AAC TCC CTC ATC GCC TGG GGC			970
	Ser Ile Ala Glu Leu Ala Gln Ala Ser Asn Ser Leu Ile Ala Trp Gly			
	290	295	300	305
35	CGG GAG TCC CCT GCC CAA GCC CCA GCC TGACCCAGT CCTTCCCTCT TGG			1020
	Arg Glu Ser Pro Ala Gln Ala Pro Ala			
	310			
	ACTCAGAGTT GGTGTGGCCT ACCTGGCTAT ACATCTTCAT CCCTCCCCAC CATCCTGGGG			1080

AAGTGATGGT GTGGCCAGGC AGTTATAGAT TAAAGGCCTG TGAGTACTGC T

1131

## (2) INFORMATION FOR SEQ ID NO: 46:

## 5 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1875

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

## 10 (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

(B) CELL KIND: Stomach cancer

15 (D) CLONE NAME: HP10413

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 79.. 666

20 (C) CHARACTERIZATION METHOD: E

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 46:

	CTCGCTCGCT CAGAGGGAGG AGAAAGTGGC GAGTTCCGGA TCCCTGCCTA GCGCGGCCCCA	60
25	ACCTTTACTC CAGAGATC ATG GCT GCC GAG GAT GTG GTG GCG ACT GGC GCC	111
	Met Ala Ala Glu Asp Val Val Ala Thr Gly Ala	
	1 5 10	
	GAC CCA AGC GAT CTG GAG AGC GGC GGG CTG CTG CAT GAG ATT TTC ACG	159
	Asp Pro Ser Asp Leu Glu Ser Gly Gly Leu Leu His Glu Ile Phe Thr	
30	15 20 25	
	TCG CCG CTC AAC CTG CTG CTG CTT GGC CTC TGC ATC TTC CTG CTC TAC	207
	Ser Pro Leu Asn Leu Leu Leu Leu Gly Leu Cys Ile Phe Leu Leu Tyr	
	30 35 40	
	AAG ATC GTG CGC GGG GAC CAG CCG GCG GCC AGC GGC GAC AGC GAC GAC	255
35	Lys Ile Val Arg Gly Asp Gln Pro Ala Ala Ser Gly Asp Ser Asp Asp	
	45 50 55	
	GAC GAG CCG CCC CCT CTG CCC CGC CTC AAG CGG CGC GAC TTC ACC CCC	303
	Asp Glu Pro Pro Pro Leu Pro Arg Leu Lys Arg Arg Asp Phe Thr Pro	

139

	60	65	70	75	
	GCC GAG CTG CGG CGC TTC GAC GGC GTC CAG GAC CCG CGC ATA CTC ATG				351
	Ala Glu Leu Arg Arg Phe Asp Gly Val Gln Asp Pro Arg Ile Leu Met				
		80	85	90	
5	GCC ATC AAC GGC AAG GTG TTC GAT GTG ACC AAA GGC CGC AAA TTC TAC				399
	Ala Ile Asn Gly Lys Val Phe Asp Val Thr Lys Gly Arg Lys Phe Tyr				
		95	100	105	
	GGG CCC GAG GGC CCG TAT GGC GTC TTT GCT GGA AGA GAT GCA TCC AGG				447
	Gly Pro Glu Gly Pro Tyr Gly Val Phe Ala Gly Arg Asp Ala Ser Arg				
10		110	115	120	
	GGC CTT GCC ACA TTT TGC CTG GAT AAG GAA GCA CTG AAG GAT GAG TAC				495
	Gly Leu Ala Thr Phe Cys Leu Asp Lys Glu Ala Leu Lys Asp Glu Tyr				
		125	130	135	
	GAT GAC CTT TCT GAC CTC ACT GCT GCC CAG CAG GAG ACT CTG AGT GAC				543
15	Asp Asp Leu Ser Asp Leu Thr Ala Ala Gln Gln Glu Thr Leu Ser Asp				
		140	145	150	155
	TGG GAG TCT CAG TTC ACT TTC AAG TAT CAT CAC GTG GGC AAA CTG CTG				591
	Trp Glu Ser Gln Phe Thr Phe Lys Tyr His His Val Gly Lys Leu Leu				
		160	165	170	
20	AAG GAG GGC GAG GAG CCC ACT GTG TAC TCA GAT GAG GAA GAA CCA AAA				639
	Lys Glu Gly Glu Glu Pro Thr Val Tyr Ser Asp Glu Glu Glu Pro Lys				
		175	180	185	
	GAT GAG AGT GCC CGG AAA AAT GAT TAAAGCATTC AGTGGAAGTA TATCTAT				690
	Asp Glu Ser Ala Arg Lys Asn Asp				
25		190	195		
	TTTTGTATTT TGCAAAATCA TTTGTAACAG TCCACTCTGT CTTTAAAACA TAGTGATTAC				750
	AATATTTAGA AAGTTTTGAG CACTTGCTAT AAGTTTTTTA TAACATCACT AGTGACACTA				810
	ATAAAATTAA CTTCTTAGAA TGCATGATGT GTTTGTGTGT CACAAATCCA GAAAGTGAAC				870
	TGCAGTGCTG TAATACACAT GTTAATACTG TTTTCTTCT ATCTGTAGTT AGTACAGGAT				930
30	GAATTTAAAT GTGTTTTTCC TGAGAGACAA GGAAGACTTG GGTATTTCCC AAAACAGGTA				990
	AAAATCTTAA ATGTGCACCA AGAGCAAAGG ATCAACTTTT AGTCATGATG TTCTGTAAAG				1050
	ACAACAAATC CCTTTTTTTT TCTCAATTGA CTTAACTGCA TGATTTCTGT TTTATCTACC				1110
	TCTAAAGCAA ATCTGCAGTG TTCCAAAGAC TTTGGTATGG ATTAAGCGCT GTCCAGTAAC				1170
	AAAATGAAAT CTCAAAACAG AGCTCAGCTG CAAAAAGCA TATTTTCTGT GTTTCTGGAC				1230
35	TGCACTGTTG TCCTTGCCCT CACATAGACA CTCAGACACC CTCACAAACA CAGTAGTCTA				1290
	TAGTTAGGAT TAAAATAGGA TCTGAACATT CAAAAGAAAG CTTTGAAAAA AAAGAGCTGG				1350
	CTGGCCTAAA AACCTAAATA TATGATGAAG ATTGTAGGAC TGTCTTCCCA AGCCCCATGT				1410
	TCATGGTGGG GCAATGGTTA TTTGGTTATT TTA CTCAATT GGTTACTCTC ATTTGAAATG				1470

140

AGGGAGGGAC ATACAGAATA GGAACAGGTG TTTGCTCTCC TAAGAGCCTT CATGCACACC 1530  
 CCTGAACCAC GAGGAAACAG TACAGTCGCT AGTCAAGTGG TTTTAAAGT AAAGTATATT 1590  
 CATAAGGTAA CAGTTATTCT GTTGTTATAA AACTATACCC ACTGCAAAAAG TAGTAGTCAA 1650  
 GTGTCTAGGT CTTTGATATT GCTCTTTTGG TTAACACTAA GCTTAAGTAG ACTATACAGT 1710  
 5 TGTATGAATT TGTAAGTA TATGAACACC TAGTGAGATT TCAAACCTGT AATTGTGGTT 1770  
 AAATAGTCAT TGTATTTTCT TGTGAACGTG GTTTTATGAT TTTACCTCAA ATCAGAAAAC 1830  
 AAAATGATGT GCTTTGGTCA GTTAATAAAA ATGGTTTTAC CCACT 1875

## 10 (2) INFORMATION FOR SEQ ID NO: 47:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1563

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

15 (D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

20 (B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10415

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

25 (B) EXISTENCE POSITION: 72.. 1460

(C) CHARACTERIZATION METHOD: E

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 47:

30 AAATTGGGCC AGGCTGAGGC GCTGCTGCTG GAGCGGCCGA TCCGAGACGT GGCTCCCTGG 60  
 GCGGCAGAAC C ATG TTG GAC TTC GCG ATC TTC GCC GTT ACC TTC TTG CTG 110  
 Met Leu Asp Phe Ala Ile Phe Ala Val Thr Phe Leu Leu  
 1 5 10  
 GCG TTG GTG GGA GCC GTG CTC TAC CTC TAT CCG GCT TCC AGA CAA GCT 158  
 35 Ala Leu Val Gly Ala Val Leu Tyr Leu Tyr Pro Ala Ser Arg Gln Ala  
 15 20 25  
 GCA GGA ATT CCA GGG ATT ACT CCA ACT GAA GAA AAA GAT GGT AAT CTT 206  
 Ala Gly Ile Pro Gly Ile Thr Pro Thr Glu Glu Lys Asp Gly Asn Leu

141

	30	35	40	45	
	CCA GAT ATT GTG AAT AGT GGA AGT TTG CAT GAG TTC CTG GTT AAT TTG	254			
	Pro Asp Ile Val Asn Ser Gly Ser Leu His Glu Phe Leu Val Asn Leu				
	50	55	60		
5	CAT GAG AGA TAT GGG CCT GTG GTC TCC TTC TGG TTT GGC AGG CGC CTC	302			
	His Glu Arg Tyr Gly Pro Val Val Ser Phe Trp Phe Gly Arg Arg Leu				
	65	70	75		
	GTG GTT AGT TTG GGC ACT GTT GAT GTA CTG AAG CAG CAT ATC AAT CCC	350			
	Val Val Ser Leu Gly Thr Val Asp Val Leu Lys Gln His Ile Asn Pro				
10	80	85	90		
	AAT AAG ACA TTG GAC CCT TTT GAA ACC ATG CTG AAG TCA TTA TTA AGG	398			
	Asn Lys Thr Leu Asp Pro Phe Glu Thr Met Leu Lys Ser Leu Leu Arg				
	95	100	105		
	TAT CAA TCT GGT GGT GGC AGT GTG AGT GAA AAC CAC ATG AGG AAA AAA	446			
15	Tyr Gln Ser Gly Gly Gly Ser Val Ser Glu Asn His Met Arg Lys Lys				
	110	115	120	125	
	TTG TAT GAA AAT GGT GTG ACT GAT TCT CTG AAG AGT AAC TTT GCC CTC	494			
	Leu Tyr Glu Asn Gly Val Thr Asp Ser Leu Lys Ser Asn Phe Ala Leu				
	130	135	140		
20	CTC CTA AAG CTT TCA GAA GAA TTA TTA GAT AAA TGG CTC TCC TAC CCA	542			
	Leu Leu Lys Leu Ser Glu Glu Leu Leu Asp Lys Trp Leu Ser Tyr Pro				
	145	150	155		
	GAG ACC CAG CAC GTG CCC CTC AGC CAG CAT ATG CTT GGT TTT GCT ATG	590			
	Glu Thr Gln His Val Pro Leu Ser Gln His Met Leu Gly Phe Ala Met				
25	160	165	170		
	AAG TCT GTT ACA CAG ATG GTA ATG GGT AGT ACA TTT GAA GAT GAT CAG	638			
	Lys Ser Val Thr Gln Met Val Met Gly Ser Thr Phe Glu Asp Asp Gln				
	175	180	185		
	GAA GTC ATT CGC TTC CAG AAG AAT CAT GGC ACA GTT TGG TCT GAG ATT	686			
30	Glu Val Ile Arg Phe Gln Lys Asn His Gly Thr Val Trp Ser Glu Ile				
	190	195	200	205	
	GGA AAA GGC TTT CTA GAT GGG TCA CTT GAT AAA AAC ATG ACT CGG AAA	734			
	Gly Lys Gly Phe Leu Asp Gly Ser Leu Asp Lys Asn Met Thr Arg Lys				
	210	215	220		
35	AAA CAA TAT GAA GAT GCC CTC ATG CAA CTG GAG TCT GTT TTA AGG AAC	782			
	Lys Gln Tyr Glu Asp Ala Leu Met Gln Leu Glu Ser Val Leu Arg Asn				
	225	230	235		
	ATC ATA AAA GAA CGA AAA GGA AGG AAC TTC AGT CAA CAT ATT TTC ATT	830			

142

	Ile Ile Lys Glu Arg Lys Gly Arg Asn Phe Ser Gln His Ile Phe Ile	
	240 245 250	
	GAC TCC TTA GTA CAA GGG AAC CTT AAT GAC CAA CAG ATC CTA GAA GAC	878
	Asp Ser Leu Val Gln Gly Asn Leu Asn Asp Gln Gln Ile Leu Glu Asp	
5	255 260 265	
	AGT ATG ATA TTT TCT CTG GCC AGT TGC ATA ATA ACT GCA AAA TTG TGT	926
	Ser Met Ile Phe Ser Leu Ala Ser Cys Ile Ile Thr Ala Lys Leu Cys	
	270 275 280 285	
	ACC TGG GCA ATC TGT TTT TTA ACC ACC TCT GAA GAA GTT CAA AAA AAA	974
10	Thr Trp Ala Ile Cys Phe Leu Thr Thr Ser Glu Glu Val Gln Lys Lys	
	290 295 300	
	TTA TAT GAA GAG ATA AAC CAA GTT TTT GGA AAT GGT CCT GTT ACT CCA	1022
	Leu Tyr Glu Glu Ile Asn Gln Val Phe Gly Asn Gly Pro Val Thr Pro	
	305 310 315	
15	GAG AAA ATT GAG CAG CTC AGA TAT TGT CAG CAT GTG CTT TGT GAA ACT	1070
	Glu Lys Ile Glu Gln Leu Arg Tyr Cys Gln His Val Leu Cys Glu Thr	
	320 325 330	
	GTT CGA ACT GCC AAA CTG ACT CCA GTT TCT GCC CAG CTT CAA GAT ATT	1118
	Val Arg Thr Ala Lys Leu Thr Pro Val Ser Ala Gln Leu Gln Asp Ile	
20	335 340 345	
	GAA GGA AAA ATT GAC CGA TTT ATT ATT CCT AGA GAG ACC CTC GTC CTT	1166
	Glu Gly Lys Ile Asp Arg Phe Ile Ile Pro Arg Glu Thr Leu Val Leu	
	350 355 360 365	
	TAT GCC CTT GGT GTG GTA CTT CAG GAT CCT AAT ACT TGG CCA TCT CCA	1214
25	Tyr Ala Leu Gly Val Val Leu Gln Asp Pro Asn Thr Trp Pro Ser Pro	
	370 375 380	
	CAC AAG TTT GAT CCA GAT CGG TTT GAT GAT GAA TTA GTA ATG AAA ACT	1262
	His Lys Phe Asp Pro Asp Arg Phe Asp Asp Glu Leu Val Met Lys Thr	
	385 390 395	
30	TTT TCC TCA CTT GGA TTC TCA GGC ACA CAG GAG TGT CCA GAG TTG AGG	1310
	Phe Ser Ser Leu Gly Phe Ser Gly Thr Gln Glu Cys Pro Glu Leu Arg	
	400 405 410	
	TTT GCA TAT ATG GTG ACC ACA GTA CTT CTT AGT GTA TTG GTG AAG AGA	1358
	Phe Ala Tyr Met Val Thr Thr Val Leu Leu Ser Val Leu Val Lys Arg	
35	415 420 425	
	CTG CAC CTA CTT TCT GTG GAG GGA CAG GTT ATT GAA ACA AAG TAT GAA	1406
	Leu His Leu Leu Ser Val Glu Gly Gln Val Ile Glu Thr Lys Tyr Glu	
	430 435 440 445	



143

CTG GTA ACA TCA TCA AGG GAA GAA GCT TGG ATC ACT GTC TCA AAG AGA 1454  
 Leu Val Thr Ser Ser Arg Glu Glu Ala Trp Ile Thr Val Ser Lys Arg

450

455

460

TAT TAAAATTTTA TACATTTAAA ATCATTGTGA AATTGATTGA GGAAAACAAC CAT 1510

5 Tyr

TTAAAAA TCTATGTTGA ATCCTTTTAT AAACCAGTAT CACTTTGTAA TAT 1563

10 (2) INFORMATION FOR SEQ ID NO: 48:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 2030

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

15 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

20 (B) CELL KIND: Stomach cancer

(D) CLONE NAME: HP10419

(ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

25 (B) EXISTENCE POSITION: 171.. 914

(C) CHARACTERIZATION METHOD: E

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 48:

30 CATTGGGGT TTCGGTCCC CCCCTTCCCC TTCCCCGGGG TCTGGGGGTG ACATTGCACC 60

GCGCCCCTCG TGGGGTCGCG TTGCCACCCC ACGCGGACTC CCCAGCTGGC GCGCCCCTCC 120

CATTGCGCTG TCCTGGTCAG GCCCCACCC CCCTTCCCAC CTGACCAGCC ATG GGG 176

Met Gly

1

35 GCT GCG GTG TTT TTC GGC TGC ACT TTC GTC GCG TTC GGC CCG GCC TTC 224

Ala Ala Val Phe Phe Gly Cys Thr Phe Val Ala Phe Gly Pro Ala Phe

5

10

15

GCG CTT TTC TTG ATC ACT GTG GCT GGG GAC CCG CTT CGC GTT ATC ATC 272

144

	Ala	Leu	Phe	Leu	Ile	Thr	Val	Ala	Gly	Asp	Pro	Leu	Arg	Val	Ile	Ile	
	20						25					30					
	CTG	GTC	GCA	GGG	GCA	TTT	TTC	TGG	CTG	GTC	TCC	CTG	CTC	CTG	GCC	TCT	320
	Leu	Val	Ala	Gly	Ala	Phe	Phe	Trp	Leu	Val	Ser	Leu	Leu	Leu	Ala	Ser	
5	35					40					45				50		
	GTG	GTC	TGG	TTC	ATC	TTG	GTC	CAT	GTG	ACC	GAC	CGG	TCA	GAT	GCC	CGG	368
	Val	Val	Trp	Phe	Ile	Leu	Val	His	Val	Thr	Asp	Arg	Ser	Asp	Ala	Arg	
					55					60					65		
	CTC	CAG	TAC	GGC	CTC	CTG	ATT	TTT	GGT	GCT	GCT	GTC	TCT	GTC	CTT	CTA	416
10	Leu	Gln	Tyr	Gly	Leu	Leu	Ile	Phe	Gly	Ala	Ala	Val	Ser	Val	Leu	Leu	
				70					75						80		
	CAG	GAG	GTG	TTC	CGC	TTT	GCC	TAC	TAC	AAG	CTG	CTT	AAG	AAG	GCA	GAT	464
	Gln	Glu	Val	Phe	Arg	Phe	Ala	Tyr	Tyr	Lys	Leu	Leu	Lys	Lys	Ala	Asp	
		85					90							95			
15	GAG	GGG	TTA	GCA	TCG	CTG	AGT	GAG	GAC	GGA	AGA	TCA	CCC	ATC	TCC	ATC	512
	Glu	Gly	Leu	Ala	Ser	Leu	Ser	Glu	Asp	Gly	Arg	Ser	Pro	Ile	Ser	Ile	
		100					105							110			
	CGC	CAG	ATG	GCC	TAT	GTT	TCT	GGT	CTC	TCC	TTC	GGT	ATC	ATC	AGT	GGT	560
	Arg	Gln	Met	Ala	Tyr	Val	Ser	Gly	Leu	Ser	Phe	Gly	Ile	Ile	Ser	Gly	
20	115					120					125				130		
	GTC	TTC	TCT	GTT	ATC	AAT	ATT	TTG	GCT	GAT	GCA	CTT	GGG	CCA	GGT	GTG	608
	Val	Phe	Ser	Val	Ile	Asn	Ile	Leu	Ala	Asp	Ala	Leu	Gly	Pro	Gly	Val	
					135						140				145		
	GTT	GGG	ATC	CAT	GGA	GAC	TCA	CCC	TAT	TAC	TTC	CTG	ACT	TCA	GCC	TTT	656
25	Val	Gly	Ile	His	Gly	Asp	Ser	Pro	Tyr	Tyr	Phe	Leu	Thr	Ser	Ala	Phe	
				150						155					160		
	CTG	ACA	GCA	GCC	ATT	ATC	CTG	CTC	CAT	ACC	TTT	TGG	GGA	GTT	GTG	TTC	704
	Leu	Thr	Ala	Ala	Ile	Ile	Leu	Leu	His	Thr	Phe	Trp	Gly	Val	Val	Phe	
		165					170							175			
30	TTT	GAT	GCC	TGT	GAG	AGG	AGA	CGG	TAC	TGG	GCT	TTG	GGC	CTG	GTG	GTT	752
	Phe	Asp	Ala	Cys	Glu	Arg	Arg	Arg	Tyr	Trp	Ala	Leu	Gly	Leu	Val	Val	
		180					185							190			
	GGG	AGT	CAC	CTA	CTG	ACA	TCG	GGA	CTG	ACA	TTC	CTG	AAC	CCC	TGG	TAT	800
	Gly	Ser	His	Leu	Leu	Thr	Ser	Gly	Leu	Thr	Phe	Leu	Asn	Pro	Trp	Tyr	
35	195					200					205				210		
	GAG	GCC	AGC	CTG	CTG	CCC	ATC	TAT	GCA	GTC	ACT	GTT	TCC	ATG	GGG	CTC	848
	Glu	Ala	Ser	Leu	Leu	Pro	Ile	Tyr	Ala	Val	Thr	Val	Ser	Met	Gly	Leu	
					215						220				225		

145

TGG GCC TTC ATC ACA GCT GGA GGG TCC CTC CGA AGT ATT CAG CGC AGC 896  
Trp Ala Phe Ile Thr Ala Gly Gly Ser Leu Arg Ser Ile Gln Arg Ser  
230 235 240  
CTC TTG TGT AAG GAC TGA CTACCTG GACTGATCGC CTGACAGATC CCACCTGCC 950  
5 Leu Leu Cys Lys Asp  
245  
TGTCCACTGC CCATGACTGA GCCCAGCCCC AGCCCGGGTC CATTGCCCAC ATTCTCTGTC 1010  
TCCTTCTCGT CGGTCTACCC CACTACCTCC AGGGTTTTGC TTTGTCCTTT TGTGACCGTT 1070  
AGTCTCTAAG CTTTACCAGG AGCAGCCTGG GTTCAGCCAG TCAGTGA CTG GTGGGTTTGA 1130  
10 ATCTGCACTT ATCCCCACCA CCTGGGGACC CCCTTGTTGT GTCCAGGACT CCCCTGTGT 1190  
CAGTGCTCTG CTCTACCCCT GCCAAGACT CACCTCCCTT CCCCTCTGCA GGCCGACGGC 1250  
AGGAGGACAG TCGGGTGATG GTGTATTCTG CCCTGCGCAT CCCACCCGAG GACTGAGGGA 1310  
ACCTAGGGGG GACCCCTGGG CCTGGGGTGC CCTCTGATG TCCTCGCCCT GTATTTCTCC 1370  
ATCTCCAGTT CTGGACAGTG CAGGTTGCCA AGAAAAGGGA CCTAGTTTAG CCATTGCCCT 1430  
15 GGAGATGAAA TTAATGGAGG CTCAAGGATA GATGAGCTCT GAGTTTCTCA GTACTCCCTC 1490  
AAGACTGGAC ATCTTGGTCT TTTTCTCAGG CCTGAGGGGG AACCATTTTT GGTGTGATAA 1550  
ATACCCTAAA CTGCCTTTTT TTCTTTTTTG AGGTGGGGGG AGGGAGGAGG TATATTGGAA 1610  
CTCTTCTAAC CTCCTTGGGC TATATTTTCT CTCCTCGAGT TGCTCCTCAT GGCTGGGCTC 1670  
ATTTGGGTCC CTTTCTCCTT GGTCCCAGAC CTTGGGGGAA AGGAAGGAAG TGCATGTTTG 1730  
20 GGAAGTGGCA TTA CTGGAAC TAATGGTTTT AACCTCCTTA ACCACCAGCA TCCCTCCTCT 1790  
CCCCAAGGTG AAGTGGAGGG TGCTGTGGTG AGCTGGCCAC TCCAGAGCTG CAGTGCCACT 1850  
GGAGGAGTCA GACTACCATG ACATCGTAGG GAAGGAGGGG AGATTTTTTT GTAGTTTTTA 1910  
ATTGGGGTGT GGGAGGGGCG GGGAGGTTTT CTATAAACTG TATCATTTTC TGCTGAGGGT 1970  
GGAGTGTCCT ATCCTTTTAA TCAAGGTGAT TGTGATTTTG ACTAATAAAA AAGAATTTGT 2030  
25

## (2) INFORMATION FOR SEQ ID NO: 49:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 493  
(B) TYPE: Nucleic acid  
(C) STRANDEDNESS: Double  
(D) TOPOLOGY: Linear  
(ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
(B) CELL KIND: Stomach cancer  
(D) CLONE NAME: HP10424

146

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 98.. 439

(C) CHARACTERIZATION METHOD: E

5

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 49:

	AAAGTTTCCC AAATCCAGGC GGCTAGAGGC CCACTGCTTC CCAACTACCA GCTGAGGGGG	60
	TCCGTCCCGA GAAGGGAGAA GAGGCCGAAG AGGAAAC ATG AAC TTC TAT TTA CTC	115
10	Met Asn Phe Tyr Leu Leu	
	1 5	
	CTA GCG AGC AGC ATT CTG TGT GCC TTG ATT GTC TTC TGG AAA TAT CGC	163
	Leu Ala Ser Ser Ile Leu Cys Ala Leu Ile Val Phe Trp Lys Tyr Arg	
	10 15 20	
15	CGC TTT CAG AGA AAC ACT GGC GAA ATG TCA TCA AAT TCA ACT GCT CTT	211
	Arg Phe Gln Arg Asn Thr Gly Glu Met Ser Ser Asn Ser Thr Ala Leu	
	25 30 35	
	GCA CTA GTG AGA CCC TCT TCT TCT GGC TTA ATT AAC AGC AAT ACA GAC	259
	Ala Leu Val Arg Pro Ser Ser Ser Gly Leu Ile Asn Ser Asn Thr Asp	
20	40 45 50	
	AAC AAT CTT GCA GTC TAC GAC CTC TCT CGG GAT ATT TTA AAT AAT TTC	307
	Asn Asn Leu Ala Val Tyr Asp Leu Ser Arg Asp Ile Leu Asn Asn Phe	
	55 60 65 70	
	CCA CAC TCA ATA GCC AGG CAG AAG CGA ATA TTG GTA AAC CTC AGT ATG	355
25	Pro His Ser Ile Ala Arg Gln Lys Arg Ile Leu Val Asn Leu Ser Met	
	75 80 85	
	GTG GAA AAC AAG CTG GTT GAA CTG GAA CAT ACT CTA CTT AGC AAG GGT	403
	Val Glu Asn Lys Leu Val Glu Leu Glu His Thr Leu Leu Ser Lys Gly	
	90 95 100	
30	TTC AGA GGT GCA TCA CCT CAC CGG AAA TCC ACC TAAAAGCGTA CAGG	450
	Phe Arg Gly Ala Ser Pro His Arg Lys Ser Thr	
	105 110	
	ATGTAATGCC AGTGGTGGAA ATCATTAAG ACACTTTGA GTAG	493

35

## (2) INFORMATION FOR SEQ ID NO: 50:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 2044

147

(B) TYPE: Nucleic acid  
 (C) STRANDEDNESS: Double  
 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

5

(vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Epidermoid carcinoma  
 (C) CELL LINE: KB  
 (D) CLONE NAME: HP10428

10

(ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS  
 (B) EXISTENCE POSITION: 288.. 1385  
 (C) CHARACTERIZATION METHOD: E

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 50:

	AGATTCCGGC CTGGAGCTCC CAGGGCCGAG CAGACCTTGG GACCTGTGAG CGCTGCATCC	60
20	AATTAACCAT GGGAAGGGTC AGCACCAGCC ACCAGCCCCT TAGGTGAGGA CTCTGCCTGG	120
	GGCTCTGCTG ATGGTTCCGA ATCATGGAGC TGCAGAGAGC TCCTCCAGCC TGGAGACGTT	180
	CTTGGTGAAA GCTGTGGTCT AACTCCACCG GCTCTTCCTG CACATTGTAT TCAAGAGGGG	240
	TGCTTGCCCC CGCTGACTCA GGAGCTCCGG TGCTGCAGCC GCCACGA ATG GGG AGG	296
		Met Gly Arg
25		1
	TGG GCC CTC GAT GTG GCC TTT TTG TGG AAG GCG GTG TTG ACC CTG GGG	344
	Trp Ala Leu Asp Val Ala Phe Leu Trp Lys Ala Val Leu Thr Leu Gly	
	5 10 15	
	CTG GTG CTT CTC TAC TAC TGC TTC TCC ATC GGC ATC ACC TTC TAC AAC	392
30	Leu Val Leu Leu Tyr Tyr Cys Phe Ser Ile Gly Ile Thr Phe Tyr Asn	
	20 25 30 35	
	AAG TGG CTG ACA AAG AGC TTC CAT TTC CCC CTC TTC ATG ACG ATG CTG	440
	Lys Trp Leu Thr Lys Ser Phe His Phe Pro Leu Phe Met Thr Met Leu	
	40 45 50	
35	CAC CTG GCC GTG ATC TTC CTC TTC TCC GCC CTG TCC AGG GCG CTG GTT	488
	His Leu Ala Val Ile Phe Leu Phe Ser Ala Leu Ser Arg Ala Leu Val	
	55 60 65	
	CAG TGC TCC AGC CAC AGG GCC CGT GTG GTG CTG AGC TGG GCC GAC TAC	536

148

	Gln	Cys	Ser	Ser	His	Arg	Ala	Arg	Val	Val	Leu	Ser	Trp	Ala	Asp	Tyr	
	70					75					80						
	CTC	AGA	AGA	GTG	GCT	CCC	ACA	GCT	CTG	GCG	ACG	GCG	CTT	GAC	GTG	GGC	584
	Leu	Arg	Arg	Val	Ala	Pro	Thr	Ala	Leu	Ala	Thr	Ala	Leu	Asp	Val	Gly	
5	85					90					95						
	TTG	TCC	AAC	TGG	AGC	TTC	CTG	TAT	GTC	ACC	GTC	TCG	CTG	TAC	ACA	ATG	632
	Leu	Ser	Asn	Trp	Ser	Phe	Leu	Tyr	Val	Thr	Val	Ser	Leu	Tyr	Thr	Met	
	100					105					110					115	
	ACC	AAA	TCC	TCA	GCT	GTC	CTC	TTC	ATC	TTG	ATC	TTC	TCT	CTG	ATC	TTC	680
10	Thr	Lys	Ser	Ser	Ala	Val	Leu	Phe	Ile	Leu	Ile	Phe	Ser	Leu	Ile	Phe	
	120					125					130						
	AAG	CTG	GAG	GAG	CTG	CGC	GCG	GCA	CTG	GTC	CTG	GTG	GTC	CTC	CTC	ATC	728
	Lys	Leu	Glu	Glu	Leu	Arg	Ala	Ala	Leu	Val	Leu	Val	Val	Leu	Leu	Ile	
	135					140					145						
15	GCC	GGG	GGT	CTC	TTC	ATG	TTC	ACC	TAC	AAG	TCC	ACA	CAG	TTC	AAC	GTG	776
	Ala	Gly	Gly	Leu	Phe	Met	Phe	Thr	Tyr	Lys	Ser	Thr	Gln	Phe	Asn	Val	
	150					155					160						
	GAG	GGC	TTC	GCC	TTG	GTG	CTG	GGG	GCC	TCG	TTC	ATC	GGT	GGC	ATT	CGC	824
	Glu	Gly	Phe	Ala	Leu	Val	Leu	Gly	Ala	Ser	Phe	Ile	Gly	Gly	Ile	Arg	
20	165					170					175						
	TGG	ACC	CTC	ACC	CAG	ATG	CTC	CTG	CAG	AAG	GCT	GAA	CTC	GGC	CTC	CAG	872
	Trp	Thr	Leu	Thr	Gln	Met	Leu	Leu	Gln	Lys	Ala	Glu	Leu	Gly	Leu	Gln	
	180					185					190					195	
	AAT	CCC	ATC	GAC	ACC	ATG	TTC	CAC	CTG	CAG	CCA	CTC	ATG	TTC	CTG	GGG	920
25	Asn	Pro	Ile	Asp	Thr	Met	Phe	His	Leu	Gln	Pro	Leu	Met	Phe	Leu	Gly	
	200					205					210						
	CTC	TTC	CCT	CTC	TTT	GCT	GTA	TTT	GAA	GGT	CTC	CAT	TTG	TCC	ACA	TCT	968
	Leu	Phe	Pro	Leu	Phe	Ala	Val	Phe	Glu	Gly	Leu	His	Leu	Ser	Thr	Ser	
	215					220					225						
30	GAG	AAA	ATC	TTC	CGT	TTC	CAG	GAC	ACA	GGG	CTG	CTC	CTG	CGG	GTA	CTT	1016
	Glu	Lys	Ile	Phe	Arg	Phe	Gln	Asp	Thr	Gly	Leu	Leu	Leu	Arg	Val	Leu	
	230					235					240						
	GGG	AGC	CTC	TTC	CTT	GGC	GGG	ATT	CTC	GCC	TTT	GGT	TTG	GGC	TTC	TCT	1064
	Gly	Ser	Leu	Phe	Leu	Gly	Gly	Ile	Leu	Ala	Phe	Gly	Leu	Gly	Phe	Ser	
35	245					250					255						
	GAG	TTC	CTC	CTG	GTC	TCC	AGA	ACC	TCC	AGC	CTC	ACT	CTC	TCC	ATT	GCC	1112
	Glu	Phe	Leu	Leu	Val	Ser	Arg	Thr	Ser	Ser	Leu	Thr	Leu	Ser	Ile	Ala	
	260					265					270					275	

149

	GGC ATT TTT AAG GAA GTC TGC ACT TTG CTG TTG GCA GCT CAT CTG CTG	1160
	Gly Ile Phe Lys Glu Val Cys Thr Leu Leu Leu Ala Ala His Leu Leu	
	280 285 290	
	GGC GAT CAG ATC AGC CTC CTG AAC TGG CTG GGC TTC GCC CTC TGC CTC	1208
5	Gly Asp Gln Ile Ser Leu Leu Asn Trp Leu Gly Phe Ala Leu Cys Leu	
	295 300 305	
	TCG GGA ATA TCC CTC CAC GTT GCC CTC AAA GCC CTG CAT TCC AGA GGT	1256
	Ser Gly Ile Ser Leu His Val Ala Leu Lys Ala Leu His Ser Arg Gly	
	310 315 320	
10	GAT GGT GGC CCC AAG GCC TTG AAG GGG CTG GGC TCC AGC CCC GAC CTG	1304
	Asp Gly Gly Pro Lys Ala Leu Lys Gly Leu Gly Ser Ser Pro Asp Leu	
	325 330 335	
	GAG CTG CTG CTC CGG AGC AGC CAG CGG GAG GAA GGT GAC AAT GAG GAG	1352
	Glu Leu Leu Leu Arg Ser Ser Gln Arg Glu Glu Gly Asp Asn Glu Glu	
15	340 345 350 355	
	GAG GAG TAC TTT GTG GCC CAG GGG CAG CAG TGACCAGCCA GGGCAAAT	1400
	Glu Glu Tyr Phe Val Ala Gln Gly Gln Gln	
	360 365	
	GGCTTAGAAG CAGGCCACTC CCCAGCCTGC TGCCAGCACT CACTGTGCTC AAGCCGCCAG	1460
20	GGCTCATCAT GGTAGCTGGG AGCTGTGGAC GGGAGTCACC AGGTGGTGGG GCCAAGCCAG	1520
	GGACTCATGA CTTTGTCCCC TCCCTTCAGA GCCTGGTCAC ACAAGGGGCG AGCACCAGGC	1580
	CAGCCTGGGA CTGGCCAGAG CTGGGCCCCAA GCTGCGCTGG AATCGCAGCA GGAGAGGGGA	1640
	GTGGGCTGGT TCTTCCCACC ACTTCCCAGG CTCTGACAGC CGAGACTCAT TTCCAAGGCA	1700
	CAGCAGCTTT CTAAAGGGAC TGAGTTTGGG CTGGGTTTTG GACCTCCAGG GGCTGGAGCT	1760
25	TCATCACCTG GGCAGTGTCT TTTCTCAGAG AGCAGGTTTC TTTATAGTTT GGAAATAAAT	1820
	GGTTCACGGT CCACTGGCCG CTTTGTGTTG CTGAGACGT GGGGGCAGGG AGGGGACAGT	1880
	GTGGGCCTGG CCTTCTCCTT CCTTTCCTG CCTGGAGCCT TCTTCAAATG TCTGGTCTTA	1940
	AGCCAGGCCT CCTTCATTTT CTCGCTCCTG TTAGAACACC AGTCCCCTCC CCAGTGGGGC	2000
	CCCACTGCAC CTGCTGGCAG GAAATAAATG AATGTTTACT GAGT	2044
30		

(2) INFORMATION FOR SEQ ID NO: 51:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1043

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

150

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10429

5

## (ix) SEQUENCE CHARACTERISTICS:

- (A) CHARACTERIZATION CODE: CDS  
 (B) EXISTENCE POSITION: 157.. 837  
 (C) CHARACTERIZATION METHOD: E

10

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 51:

	ATTAGCATAA CCCTTCCTCA GGAAGAGTGA GATTTTATAT TTGACAATAA AGTGTTAGAC	60
	TCCATTTCTA AATACCAGAC TTCAAAAGAT AAGGTTCAAA AGTGTTATAA GAAGATATTC	120
15	CTTTTTTTGT CCTAGAGAAC TTATTTTCCT GTGAAA ATG CCT ACC ACA AAG AAG	174
	Met Pro Thr Thr Lys Lys	
	1 5	
	ACA TTG ATG TTC TTA TCA AGC TTT TTC ACC AGC CTT GGG TCC TTC ATT	222
	Thr Leu Met Phe Leu Ser Ser Phe Phe Thr Ser Leu Gly Ser Phe Ile	
20	10 15 20	
	GTA ATT TGC TCT ATT CTT GGG ACA CAA GCA TGG ATC ACC AGT ACA ATT	270
	Val Ile Cys Ser Ile Leu Gly Thr Gln Ala Trp Ile Thr Ser Thr Ile	
	25 30 35	
	GCT GTT AGA GAC TCT GCT TCA AAT GGG AGC ATT TTC ATC ACT TAC GGA	318
25	Ala Val Arg Asp Ser Ala Ser Asn Gly Ser Ile Phe Ile Thr Tyr Gly	
	40 45 50	
	CTT TTT CGT GGG GAG AGT AGT GAA GAA TTG AGT CAC GGA CTT GCA GAA	366
	Leu Phe Arg Gly Glu Ser Ser Glu Glu Leu Ser His Gly Leu Ala Glu	
	55 60 65 70	
30	CCA AAG AAA AAG TTT GCA GTT TTA GAG ATA CTG AAT AAT TCT TCC CAA	414
	Pro Lys Lys Lys Phe Ala Val Leu Glu Ile Leu Asn Asn Ser Ser Gln	
	75 80 85	
	AAA ACT CTG CAT TCG GTG ACT ATC CTG TTC CTG GTC CTG AGT TTG ATC	462
	Lys Thr Leu His Ser Val Thr Ile Leu Phe Leu Val Leu Ser Leu Ile	
35	90 95 100	
	ACG TCG CTG CTG AGC TCT GGG TTT ACC TTC TAC AAC AGC ATC AGC AAC	510
	Thr Ser Leu Leu Ser Ser Gly Phe Thr Phe Tyr Asn Ser Ile Ser Asn	
	105 110 115	



151

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CCT TAC CAG ACA TTC CTG GGG CCG ACG GGG GTG TAC ACC TGG AAC GGG      558
Pro Tyr Gln Thr Phe Leu Gly Pro Thr Gly Val Tyr Thr Trp Asn Gly
      120                      125                      130
CTC GGT GCA TCC TTC GTT TTT GTG ACC ATG ATA CTG TTT GTG GCG AAC      606
5 Leu Gly Ala Ser Phe Val Phe Val Thr Met Ile Leu Phe Val Ala Asn
      135                      140                      145                      150
ACG CAG TCC AAC CAA CTC TCC GAA GAG TTG TTC CAA ATG CTT TAC CCG      654
Thr Gln Ser Asn Gln Leu Ser Glu Glu Leu Phe Gln Met Leu Tyr Pro
      155                      160                      165
10 GCA ACC ACC AGT AAA GGA ACG ACC CAC AGT TAC GGA TAC TCG TTC TGG      702
Ala Thr Thr Ser Lys Gly Thr Thr His Ser Tyr Gly Tyr Ser Phe Trp
      170                      175                      180
CTC ATA CTG CTC GTC ATT CTT CTA AAT ATA GTC ACT GTA ACC ATC ATC      750
Leu Ile Leu Leu Val Ile Leu Leu Asn Ile Val Thr Val Thr Ile Ile
15      185                      190                      195
ATT TTC TAC CAG AAG GCC AGA TAC CAG CGG AAG CAG GAG CAG AGA AAG      798
Ile Phe Tyr Gln Lys Ala Arg Tyr Gln Arg Lys Gln Glu Gln Arg Lys
      200                      205                      210
CCA ATG GAA TAT GCT CCA AGG GAC GGA ATT TTA TTC TGAATTCTCT TTCATC      850
20 Pro Met Glu Tyr Ala Pro Arg Asp Gly Ile Leu Phe
      215                      220                      225
TCATTTTGGC GTTGCACTCA TTGTACATCA GCCCTGAGTA GTAAC TGGTT AGCTTCTCTG      910
GACAATTCAG CATGGTAACG TGA CTGTGACAGC ATTTGTGTTT CATGACACTG      970
TGTTCTTCAT TGATGCTGTA CTCCTGAAAA TTTTCCAC AAGGTTGGGG AAATGAATGG      1030
25 GAAATGTCGC TGG      1043

```

## (2) INFORMATION FOR SEQ ID NO: 52:

## (i) SEQUENCE CHARACTERISTICS:

- 30 (A) LENGTH: 972  
 (B) TYPE: Nucleic acid  
 (C) STRANDEDNESS: Double  
 (D) TOPOLOGY: Linear

## (ii) SEQUENCE KIND: cDNA to mRNA

35

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Liver

152

(D) CLONE NAME: HP10432

## (ix) SEQUENCE CHARACTERISTICS:

(A) CHARACTERIZATION CODE: CDS

5 (B) EXISTENCE POSITION: 29.. 418

(C) CHARACTERIZATION METHOD: E

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 52:

```

10  AGACAGCGGC GGGCGCAGGA CGTGCACT ATG GCT CGG GGC TCG CTG CGC CGG      52
                                     Met Ala Arg Gly Ser Leu Arg Arg
                                     1           5
    TTG CTG CGG CTC CTC GTG CTG GGG CTC TGG CTG GCG TTG CTG CGC TCC      100
    Leu Leu Arg Leu Leu Val Leu Gly Leu Trp Leu Ala Leu Leu Arg Ser
15      10           15           20
    GTG GCC GGG GAG CAA GCG CCA GGC ACC GCC CCC TGC TCC CGC GGC AGC      148
    Val Ala Gly Glu Gln Ala Pro Gly Thr Ala Pro Cys Ser Arg Gly Ser
      25           30           35           40
    TCC TGG AGC GCG GAC CTG GAC AAG TGC ATG GAC TGC GCG TCT TGC AGG      196
20  Ser Trp Ser Ala Asp Leu Asp Lys Cys Met Asp Cys Ala Ser Cys Arg
      45           50           55
    GCG CGA CCG CAC AGC GAC TTC TGC CTG GGC TGC GCT GCA GCA CCT CCT      244
    Ala Arg Pro His Ser Asp Phe Cys Leu Gly Cys Ala Ala Ala Pro Pro
      60           65           70
25  GCC CCC TTC CGG CTG CTT TGG CCC ATC CTT GGG GGC GCT CTG AGC CTG      292
    Ala Pro Phe Arg Leu Leu Trp Pro Ile Leu Gly Gly Ala Leu Ser Leu
      75           80           85
    ACC TTC GTG CTG GGG CTG CTT TCT GGC TTT TTG GTC TGG AGA CGA TGC      340
    Thr Phe Val Leu Gly Leu Leu Ser Gly Phe Leu Val Trp Arg Arg Cys
30      90           95           100
    CGC AGG AGA GAG AAG TTC ACC ACC CCC ATA GAG GAG ACC GGC GGA GAG      388
    Arg Arg Arg Glu Lys Phe Thr Thr Pro Ile Glu Glu Thr Gly Gly Glu
    105           110           115           120
    GGC TGC CCA GCT GTG GCG CTG ATC CAG TGACA ATGT GCCCCCTGCC A CCGG      440
35  Gly Cys Pro Ala Val Ala Leu Ile Gln
      125
    GGCTCGCCCA CTCATCATTC ATTCATCCAT TCTAGAGCCA GTCTCTGCCT CCCAGACGCG      500
    GCGGGAGCCA AGCTCCTCCA ACCACAAGGG GGGTGGGGGG CGGTGAATCA CCTCTGAGGC      560

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153

CTGGGCCCAG GGTTCAGGGG AACCTTCCAA GGTGTCTGGT TGCCCTGCCT CTGGCTCCAG 620  
 AACAGAAAGG GAGCCTCACG CTGGCTCACA CAAAACAGCT GACACTGACT AAGGAACTGC 680  
 AGCATTGCA CAGGGGAGGG GGGTGCCCTC CTTCTAGAG GCCCTGGGGG CCAGGCTGAC 740  
 TTGGGGGGCA GACTTGACAC TAGGCCCCAC TCACTCAGAT GTCCTGAAAT TCCACCACGG 800  
 5 GGGTCACCCT GGGGGGTTAG GGACCTATTT TTAACACTAG GGGGCTGGCC CACTAGGAGG 860  
 GCTGGCCCTA AGATACAGAC CCCCCCACT CCCCAAAGCG GGGAGGAGAT ATTTATTTTG 920  
 GGGAGAGTTT GGAGGGGAGG GAGAATTTAT TAATAAAGA ATCTTTAACT TT 972

## 10 (2) INFORMATION FOR SEQ ID NO: 53:

## (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 695

(B) TYPE: Nucleic acid

(C) STRANDEDNESS: Double

15 (D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

## (vi) ORIGINAL SOURCE:

(A) ORGANISM: *Homo sapiens*

20 (B) CELL KIND: Liver

(C) CELL LINE:

(D) CLONE NAME: HP10433

## (ix) SEQUENCE CHARACTERISTICS:

25 (A) CHARACTERIZATION CODE: CDS

(B) EXISTENCE POSITION: 73.. 564

(C) CHARACTERIZATION METHOD: E

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 53:

30 AAGATTTTCAG CTGCGGGACG GTCAGGGGAG ACCTCCAGGC GCAGGGAAGG ACGGCCAGGG 60  
 TGACACGGAA GC ATG CGA CGG CTG CTG ATC CCT CTG GCC CTG TGG CTG GGC 111  
 Met Arg Arg Leu Leu Ile Pro Leu Ala Leu Trp Leu Gly  
 1 5 10  
 35 GCG GTG GGC GTG GGC GTC GCC GAG CTC ACG GAA GCC CAG CGC CGG GGC 159  
 Ala Val Gly Val Gly Val Ala Glu Leu Thr Glu Ala Gln Arg Arg Gly  
 15 20 25  
 CTG CAG GTG GCC CTG GAG GAA TTT CAC AAG CAC CCG CCC GTG CAG TGG 207

154

Leu Gln Val Ala Leu Glu Glu Phe His Lys His Pro Pro Val Gln Trp  
 30 35 40 45  
 GCC TTC CAG GAG ACC AGT GTG GAG AGC GCC GTG GAC ACG CCC TTC CCA 255  
 Ala Phe Gln Glu Thr Ser Val Glu Ser Ala Val Asp Thr Pro Phe Pro  
 5 50 55 60  
 GCT GGA ATA TTT GTG AGG CTG GAA TTT AAG CTG CAG CAG ACA AGC TGC 303  
 Ala Gly Ile Phe Val Arg Leu Glu Phe Lys Leu Gln Gln Thr Ser Cys  
 65 70 75  
 CGG AAG AGG GAC TGG AAG AAA CCC GAG TGC AAA GTC AGG CCC AAT GGG 351  
 10 Arg Lys Arg Asp Trp Lys Lys Pro Glu Cys Lys Val Arg Pro Asn Gly  
 80 85 90  
 AGG AAA CGG AAA TGC CTG GCC TGC ATC AAA CTG GGC TCT GAG GAC AAA 399  
 Arg Lys Arg Lys Cys Leu Ala Cys Ile Lys Leu Gly Ser Glu Asp Lys  
 95 100 105  
 15 GTT CTG GGC CGG TTG GTC CAC TGC CCC ATA GAG ACC CAA GTT CTG CGG 447  
 Val Leu Gly Arg Leu Val His Cys Pro Ile Glu Thr Gln Val Leu Arg  
 110 115 120 125  
 GAG GCT GAG GAG CAC CAG GAG ACC CAG TGC CTC AGG GTG CAG CGG GCT 495  
 Glu Ala Glu Glu His Gln Glu Thr Gln Cys Leu Arg Val Gln Arg Ala  
 20 130 135 140  
 GGT GAG GAC CCC CAC AGC TTC TAC TTC CCT GGA CAG TTC GCC TTC TCC 543  
 Gly Glu Asp Pro His Ser Phe Tyr Phe Pro Gly Gln Phe Ala Phe Ser  
 145 150 155  
 AAG GCC CTG CCC CGC AGC TAAGCCAGCA CTGAGCTGCG TGGTGCCTC 590  
 25 Lys Ala Leu Pro Arg Ser  
 160  
 CAGGACCGCT GCCGGTGGTA ACCAGTGGAA GACCCAGCC CCCAGGGAGA GGACCCCGTT 650  
 CTATCCCCAG CCATGATAAT AAAGCTGCTC TCCCAGCTGC CTCTC 695

30

(2) INFORMATION FOR SEQ ID NO: 54:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 1914

(B) TYPE: Nucleic acid

35

(C) STRANDEDNESS: Double

(D) TOPOLOGY: Linear

(ii) SEQUENCE KIND: cDNA to mRNA

155

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: *Homo sapiens*  
 (B) CELL KIND: Stomach cancer  
 (D) CLONE NAME: HP10480

5

## (ix) SEQUENCE CHARACTERISTICS:

- (A) CHARACTERIZATION CODE: CDS  
 (B) EXISTENCE POSITION: 80.. 661  
 (C) CHARACTERIZATION METHOD: E

10

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 54:

```

ACTCTCTGCT GTCGCCCGTC CCGCGCGCTC CTCCGACCCG CTCCGCTCCG CTCCGCTCGG      60
CCCCGCGCCG CCCGTCAAC ATG ATC CGC TGC GGC CTG GCC TGC GAG CGC TGC      112
15          Met Ile Arg Cys Gly Leu Ala Cys Glu Arg Cys
                1             5             10
CGC TGG ATC CTG CCC CTG CTC CTA CTC AGC GCC ATC GCC TTC GAC ATC      160
Arg Trp Ile Leu Pro Leu Leu Leu Leu Ser Ala Ile Ala Phe Asp Ile
                15             20             25
20 ATC GCG CTG GCC GGC CGC GGC TGG TTG CAG TCT AGC GAC CAC GGC CAG      208
Ile Ala Leu Ala Gly Arg Gly Trp Leu Gln Ser Ser Asp His Gly Gln
                30             35             40
ACG TCC TCG CTG TGG TGG AAA TGC TCC CAA GAG GGC GGC GGC AGC GGG      256
Thr Ser Ser Leu Trp Trp Lys Cys Ser Gln Glu Gly Gly Gly Ser Gly
25          45             50             55
TCC TAC GAG GAG GGC TGT CAG AGC CTC ATG GAG TAC GCG TGG GGT AGA      304
Ser Tyr Glu Glu Gly Cys Gln Ser Leu Met Glu Tyr Ala Trp Gly Arg
        60             65             70             75
GCA GCG GCT GCC ATG CTC TTC TGT GGC TTC ATC ATC CTG GTG ATC TGT      352
30 Ala Ala Ala Ala Met Leu Phe Cys Gly Phe Ile Ile Leu Val Ile Cys
                80             85             90
TTC ATC CTC TCC TTC TTC GCC CTC TGT GGA CCC CAG ATG CTT GTC TTC      400
Phe Ile Leu Ser Phe Phe Ala Leu Cys Gly Pro Gln Met Leu Val Phe
                95             100            105
35 CTG AGA GTG ATT GGA GGT CTC CTT GCC TTG GCT GCT GTG TTC CAG ATC      448
Leu Arg Val Ile Gly Gly Leu Leu Ala Leu Ala Ala Val Phe Gln Ile
                110            115            120
ATC TCC CTG GTA ATT TAC CCC GTG AAG TAC ACC CAG ACC TTC ACC CTT      496

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156

	Ile Ser Leu Val Ile Tyr Pro Val Lys Tyr Thr Gln Thr Phe Thr Leu			
	125	130	135	
	CAT GCC AAC CGT GCT GTC ACT TAC ATC TAT AAC TGG GCC TAC GGC TTT	544		
	His Ala Asn Arg Ala Val Thr Tyr Ile Tyr Asn Trp Ala Tyr Gly Phe			
5	140	145	150	155
	GGG TGG GCA GCC ACG ATT ATC CTG ATC GGC TGT GCC TTC TTC TTC TGC	592		
	Gly Trp Ala Ala Thr Ile Ile Leu Ile Gly Cys Ala Phe Phe Phe Cys			
	160	165	170	
	TGC CTC CCC AAC TAC GAA GAT GAC CTT CTG GGC AAT GCC AAG CCC AGG	640		
10	Cys Leu Pro Asn Tyr Glu Asp Asp Leu Leu Gly Asn Ala Lys Pro Arg			
	175	180	185	
	TAC TTC TAC ACA TCT GCC TA ACTTGGG AATGAATGTG GGAGAAAATC GCT	690		
	Tyr Phe Tyr Thr Ser Ala			
	190			
15	GCTGCTGAGA TGGACTCCAG AAGAAGAAAC TGTTCCTCCA GGCGACTTTG AACCCATTTT	750		
	TTGGCAGTGT TCATATTATT AAAGTAGTCA AAAATGCTAA AATAATTTGG GAGAAAAATAT	810		
	TTTTTAAGTA GTGTTATAGT TTCATGTTTA TCTTTTATTA TGTTTTGTGA AGTTGTGTCT	870		
	TTTCACTAAT TACCTATACT ATGCCAATAT TTCCTTATAT CTATCCATAA CATTTATACT	930		
	ACATTTGTAA GAGAATATGC ACGTGAAACT TAACACTTTA TAAGGTAAAA ATGAGGTTTC	990		
20	CAAGATTTAA TAATCTGATC AAGTTCCTGT TATTTCCAAA TAGAATGGAC TTGGTCTGTT	1050		
	AAGGGCTAAG GAGAAGAGGA AGATAAGGTT AAAAGTTGTT AATGACCAAA CATTCTAAAA	1110		
	GAAATGCAAA AAAAAAGTTT ATTTTCAAGC CTTCGAACTA TTAAAGGAAA GCAAAATCAT	1170		
	TTCTTAAATG CATATCATTT GTGAGAATTT CTCATTAATA TCCTGAATCA TTCATTTTCAG	1230		
	CTAAGGCTTC ATGTTGACTC GATATGTCAT CTAGGAAAGT ACTATTTTCAT GGTCCAAACC	1290		
25	TGTTGCCATA GTTGGTAAAG CTTTCCTTTA AGTGTGAAAT ATTTAGATGA AATTTTCTCT	1350		
	TTTAAAGTTC TTTATAGGGT TAGGGTGTGG GAAAATGCTA TATTAATAAA TCTGTAGTGT	1410		
	TTTGTGTTTA TATGTTTCTA ACCAGAGTAG ACTGGATTGA AAGATGGACT GGGTCTAATT	1470		
	TATCATGACT GATAGATCTG GTTAAGTTGT GTAGTAAAGC ATTAGGAGGG TCATTCCTGT	1530		
	CACAAAAGTG CCACTAAAAAC AGCCTCAGGA GAATAAATGA CTTGCTTTTC TAAATCTCAG	1590		
30	GTTTATCTGG GCTCTATCAT ATAGACAGGC TTCTGATAGT TTGCAACTGT AAGCAGAAAC	1650		
	CTACATATAG TTAAAAATCCT GGTCTTTCTT GGTAACACAGA TTTTAAATGT CTGATATAAA	1710		
	ACATGCCACA GGAGAAATCG GGGATTTGAG TTTCTCTGAA TAGCATATAT ATGATGCATC	1770		
	GGATAGGTCA TTATGATTTT TTACCATTTC GACTTACATA ATGAAAACCA ATTCATTTTA	1830		
	AATATCAGAT TATTATTTTG TAAGTTGTGG AAAAAGCTAA TTGTAGTTTT CATTATGAAG	1890		
35	TTTTCCCAAT AAACCAGGTA TTCT	1914		

## CLAIMS

1. A protein comprising an amino acid sequence selected  
from the group consisting of the amino acid sequences of SEQ  
5 ID NOS: 1 to 18.

2. A DNA encoding the protein according to claim 1.

3. A cDNA comprising a nucleotide sequence selected  
10 from the group consisting of the nucleotide sequences of SEQ  
ID NOS: 19 to 36.

4. A cDNA according to claim 3, which comprises a  
nucleotide sequence selected from the group consisting of the  
15 nucleotide sequences of SEQ ID NOS: 37 to 54.

5. An expression vector capable of in vitro translating  
the DNA according to any of claims 2 to 4 or expressing said  
DNA in an eukaryotic cell.

20

6. A transformed eukaryotic cell capable of expressing  
the DNA according to any of claims 2 to 4 to produce the  
protein according to claim 1.

1/19

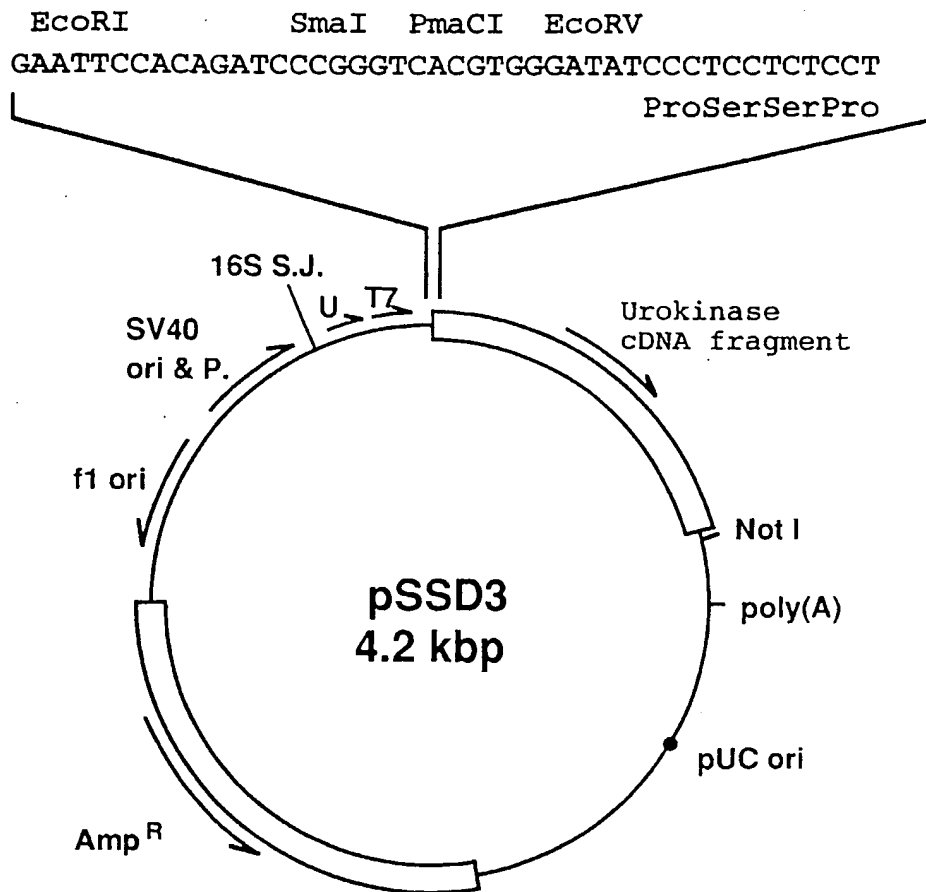


Fig.1



2/19

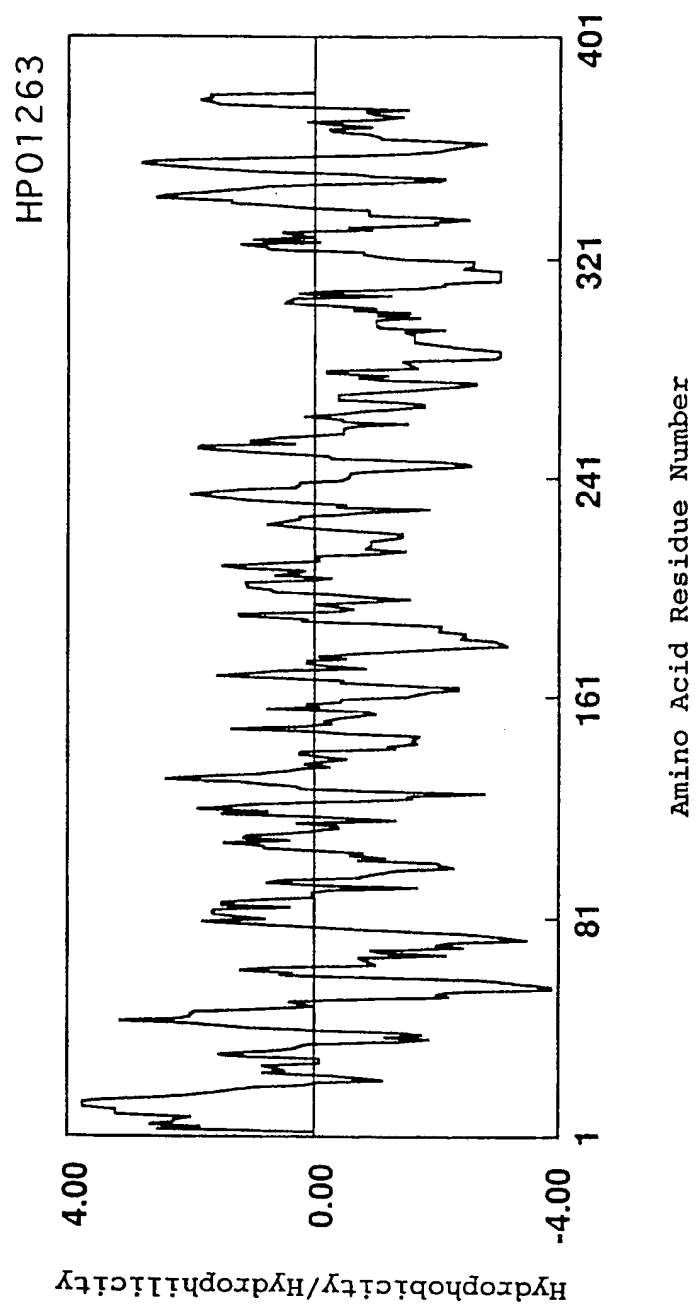


Fig.2

3/19

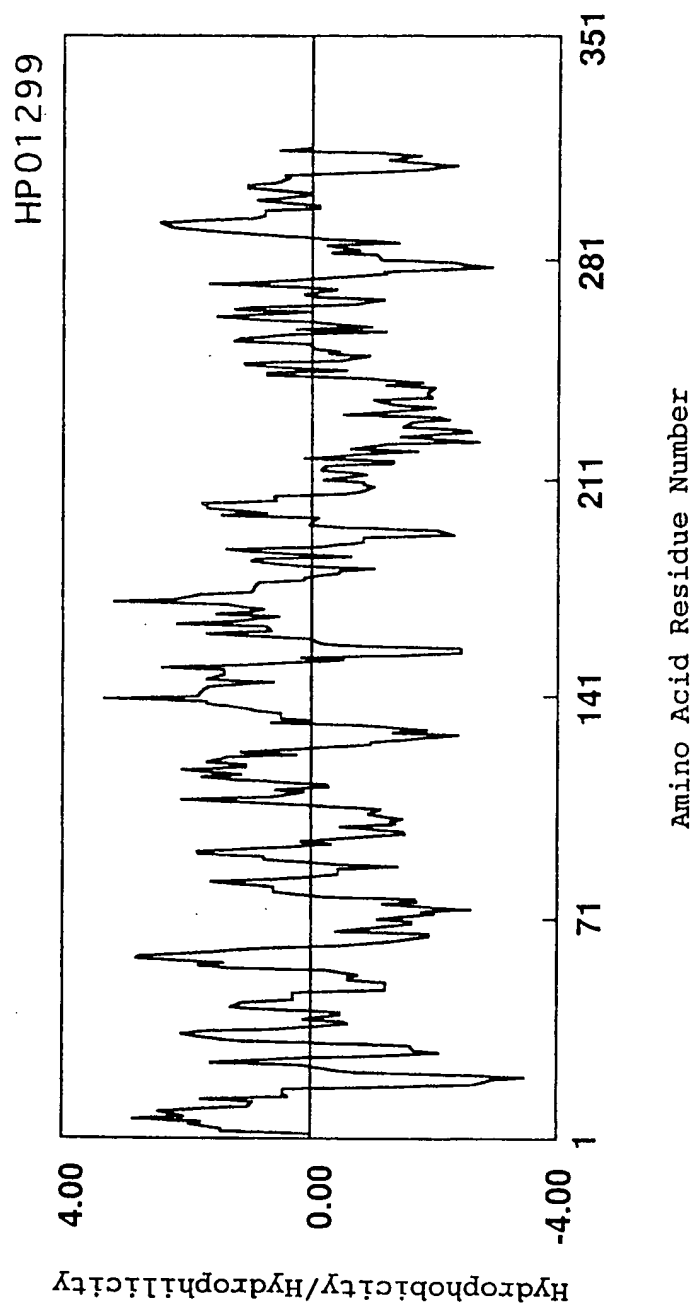


Fig.3

4/19

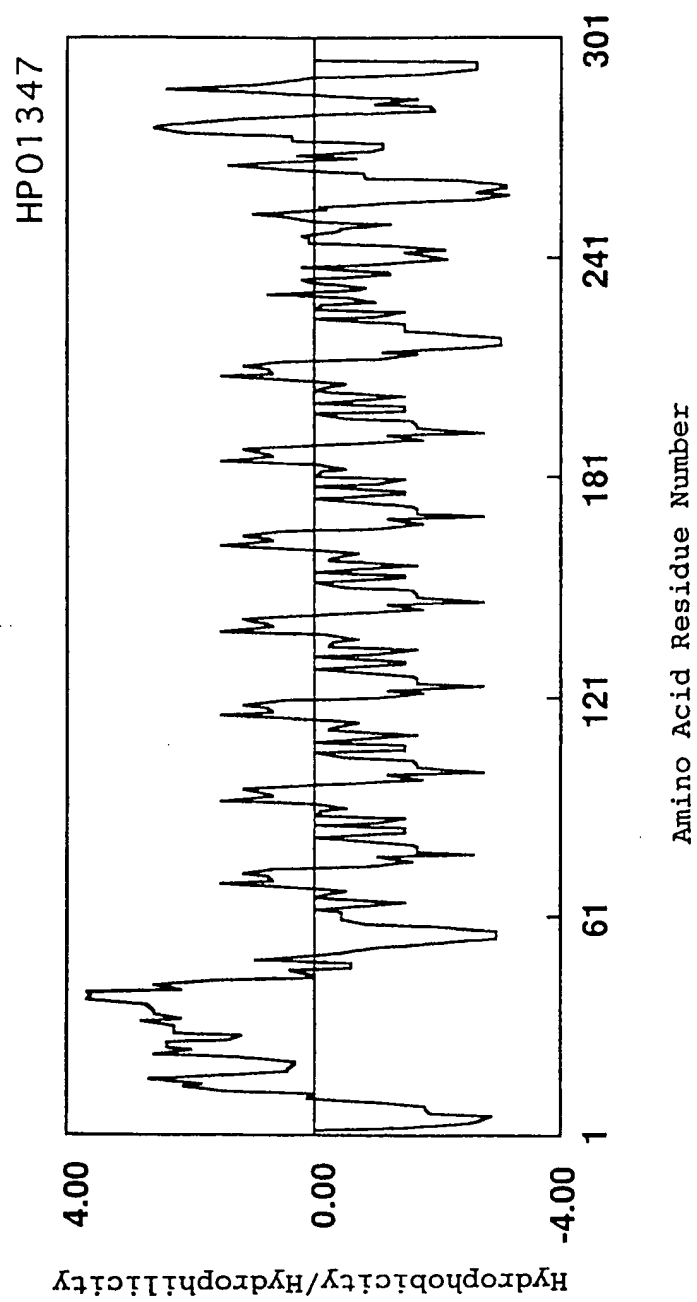


Fig.4

5/19

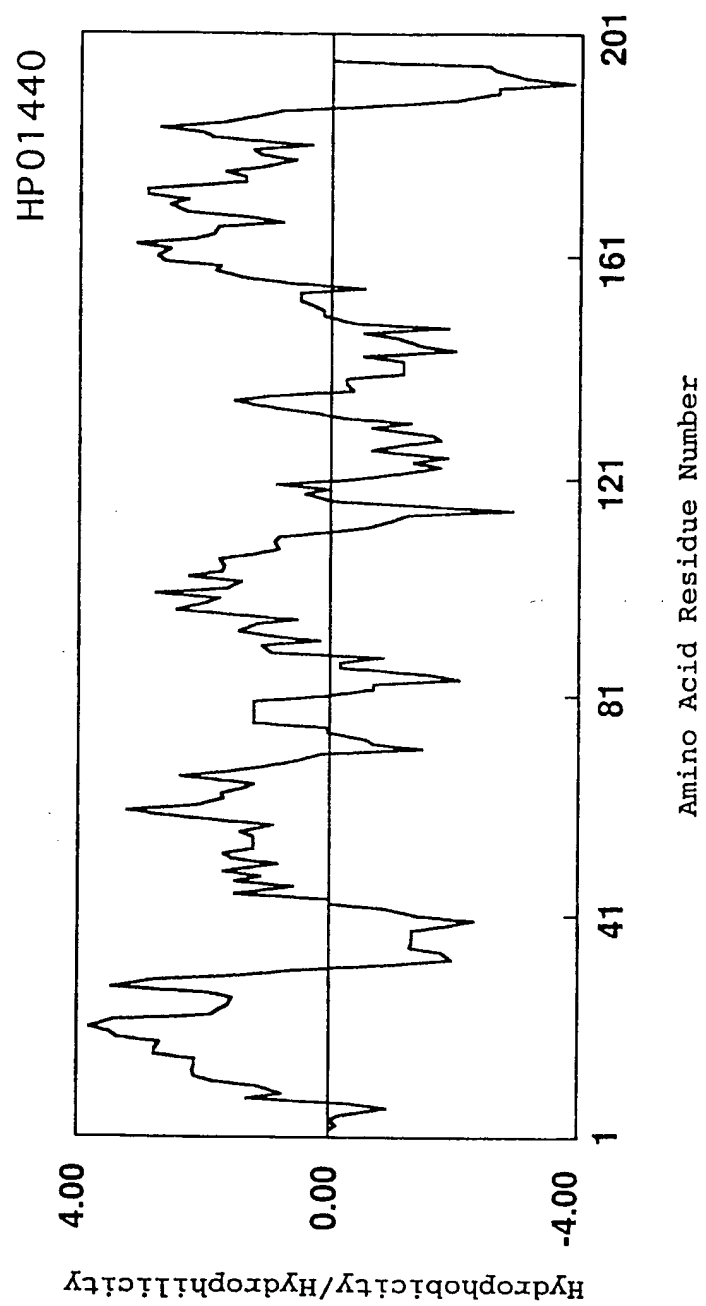


Fig.5

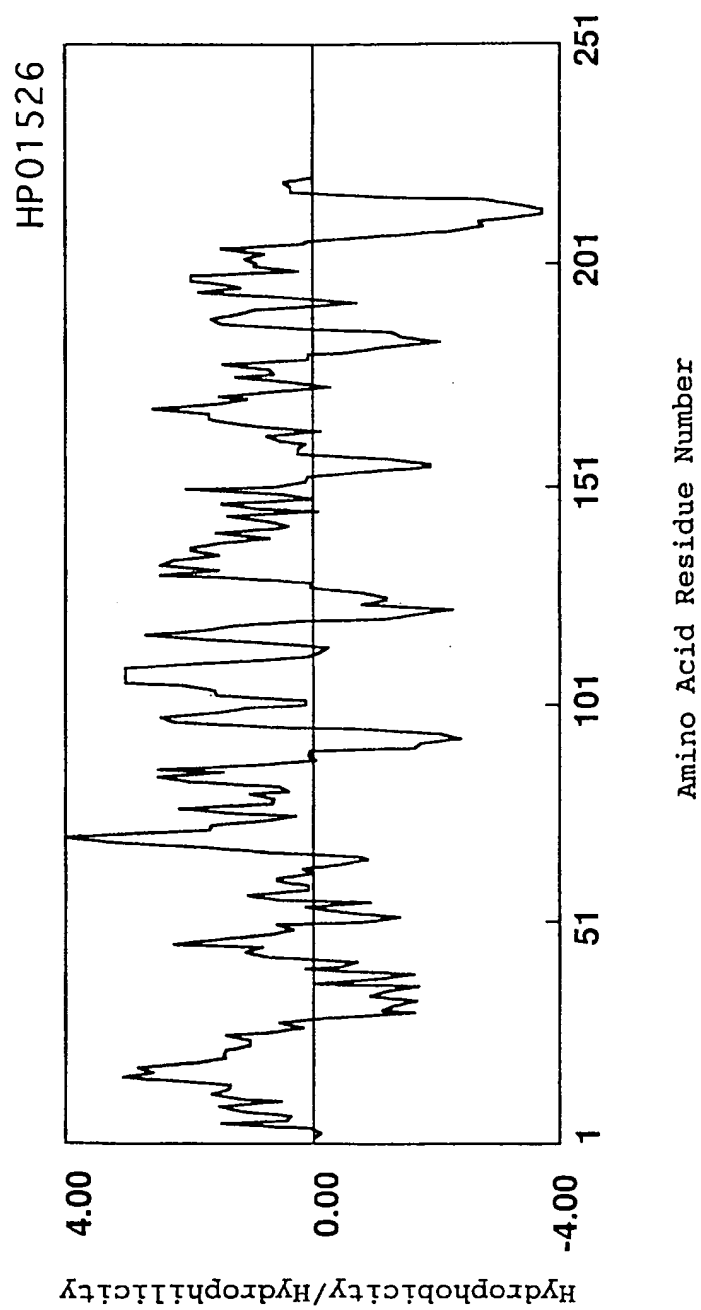


Fig.6

7/19

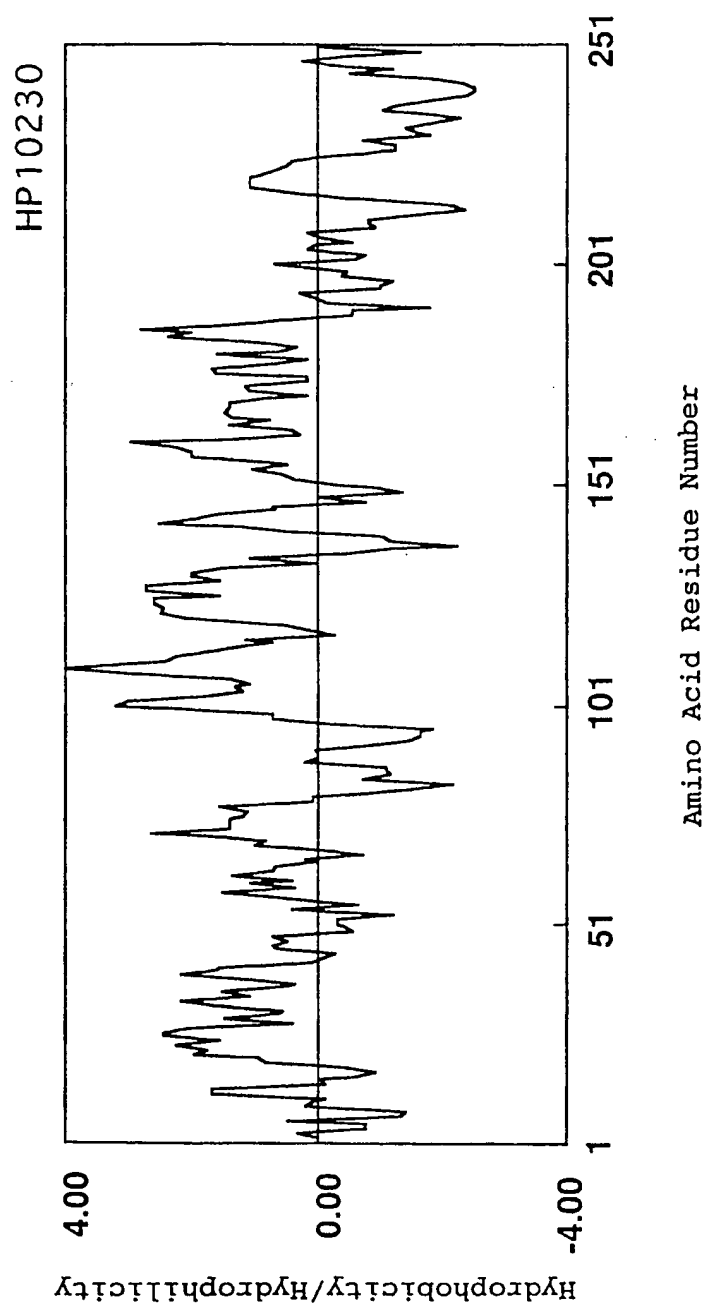


Fig.7

8/19

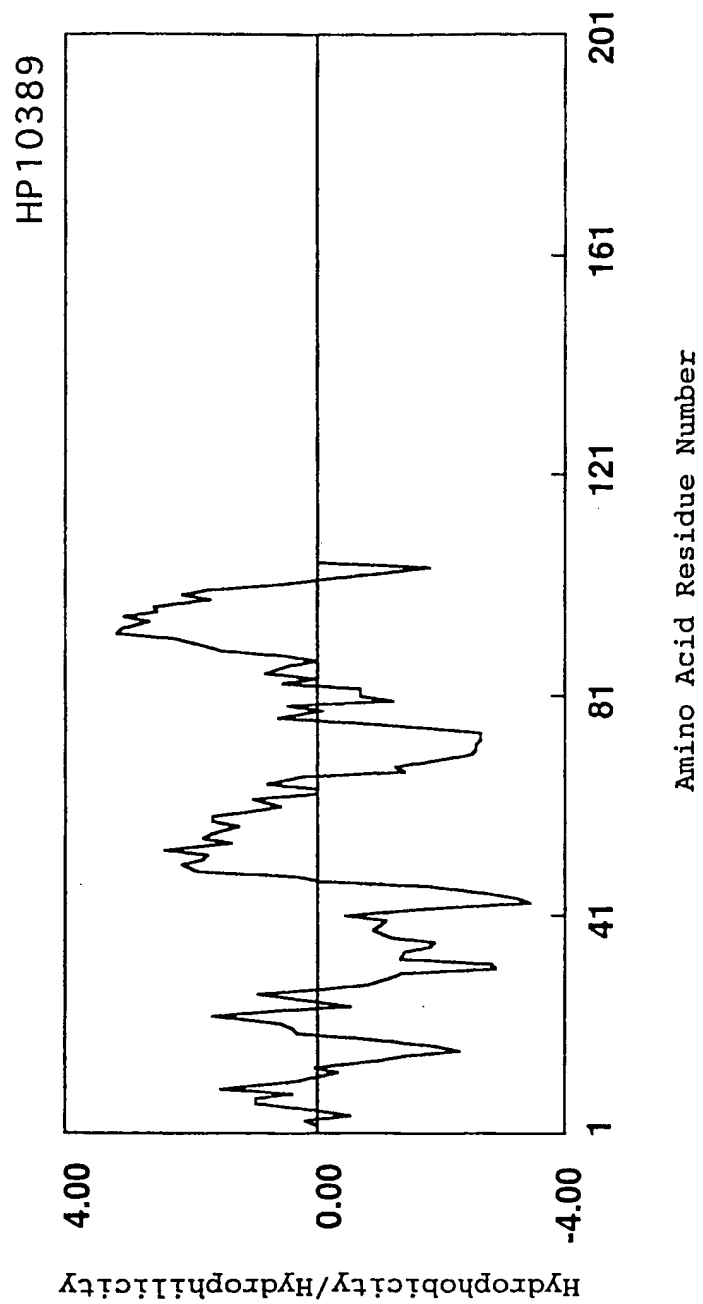


Fig.8

9/19

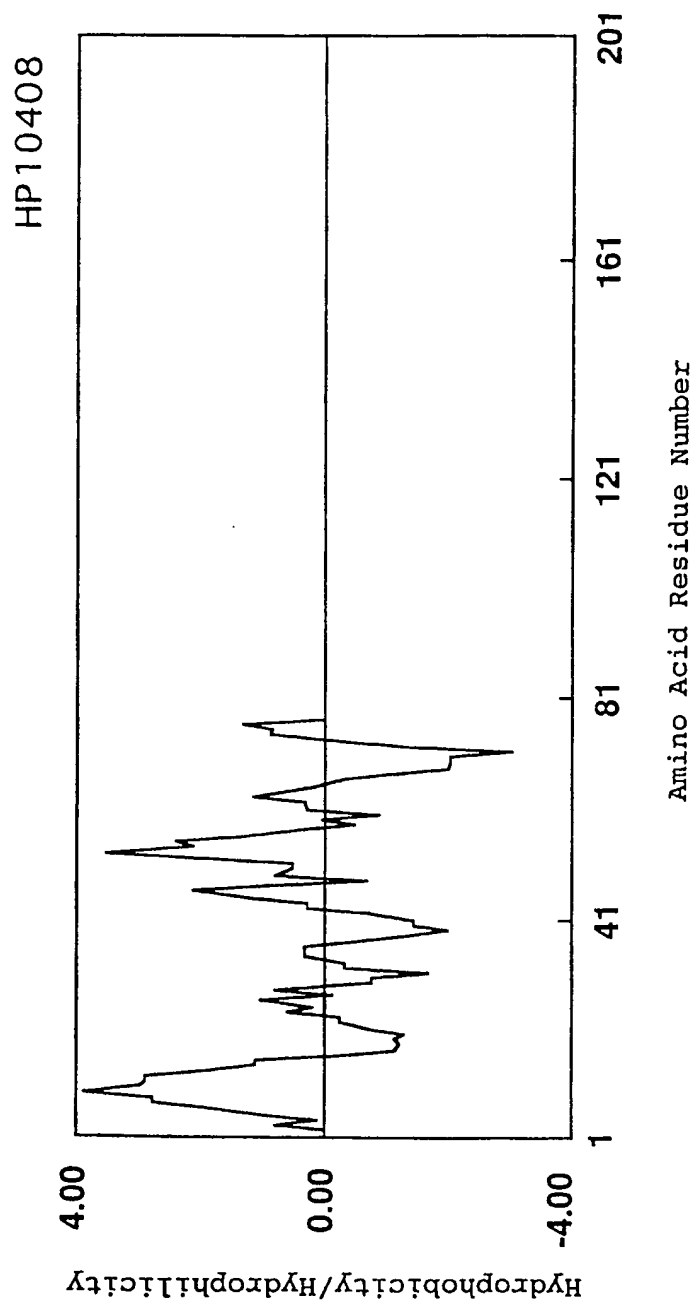


Fig.9



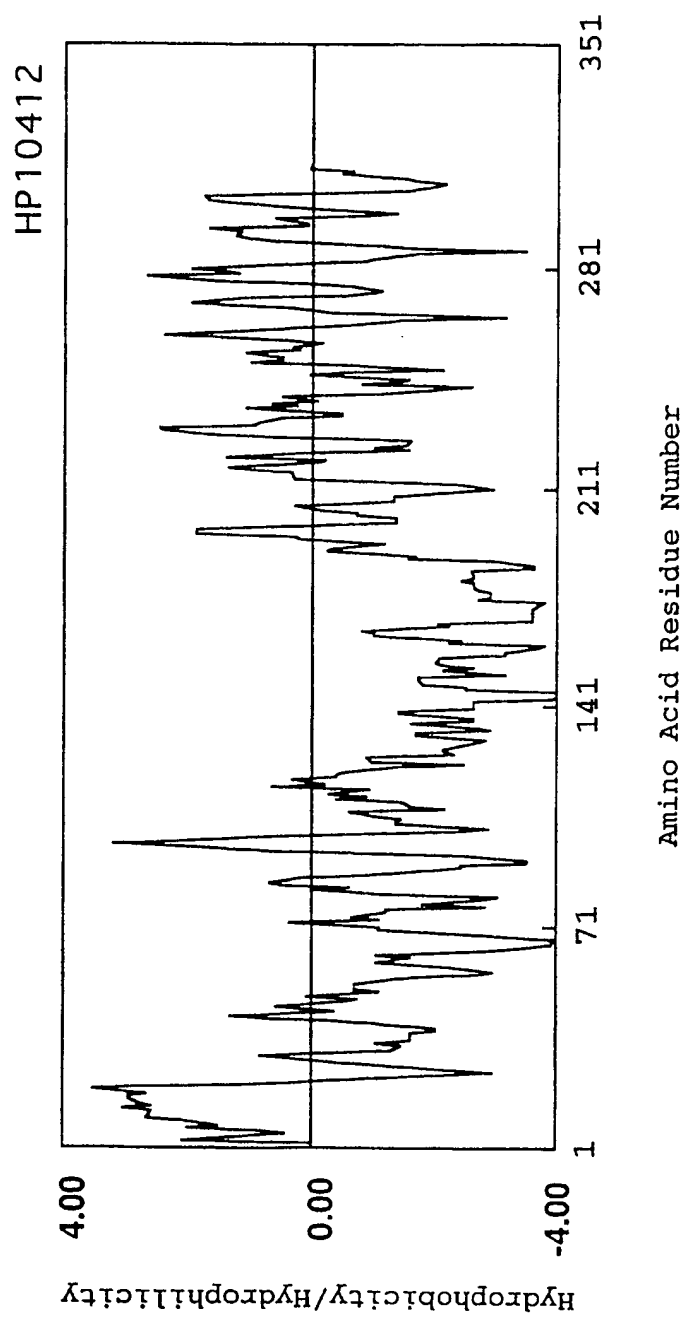


Fig.10

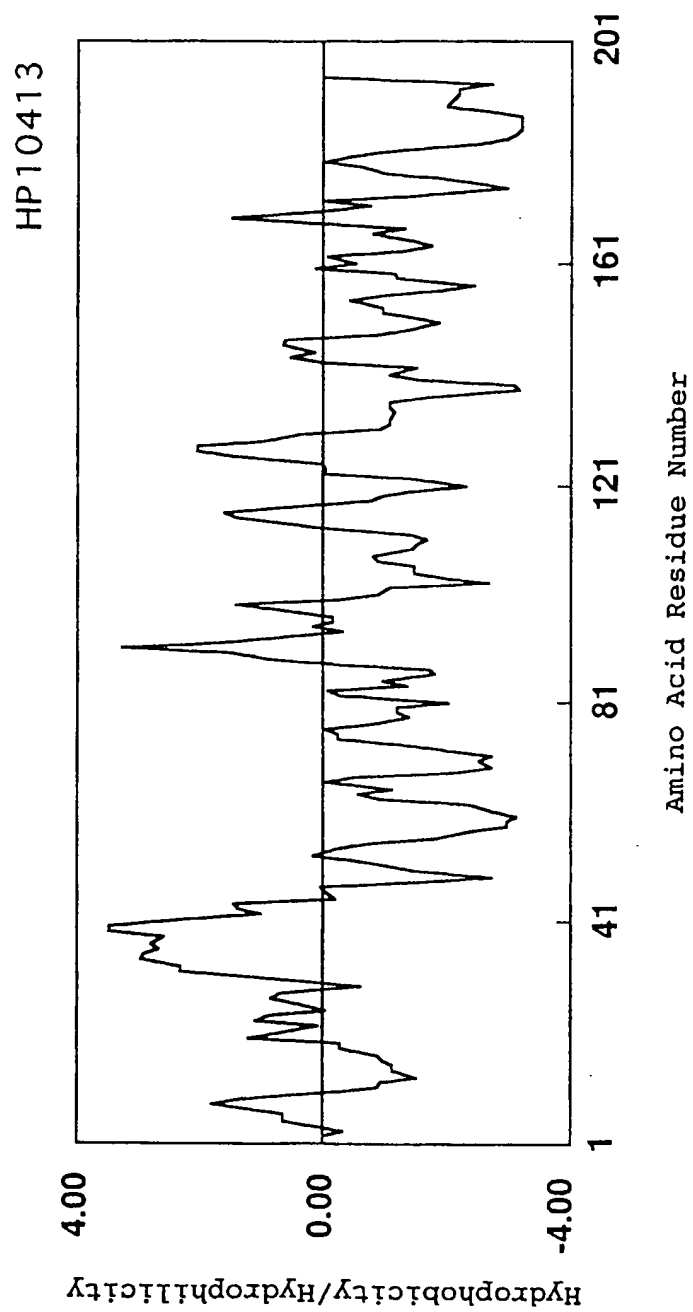


Fig.11

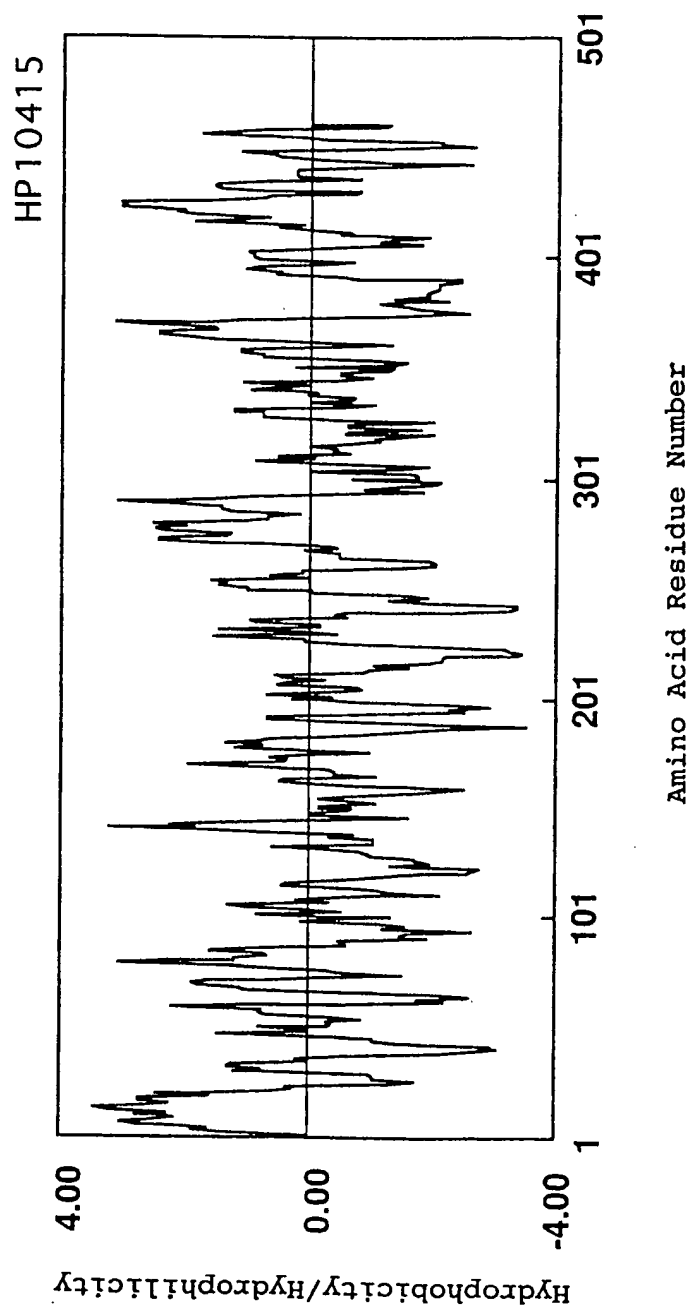


Fig.12

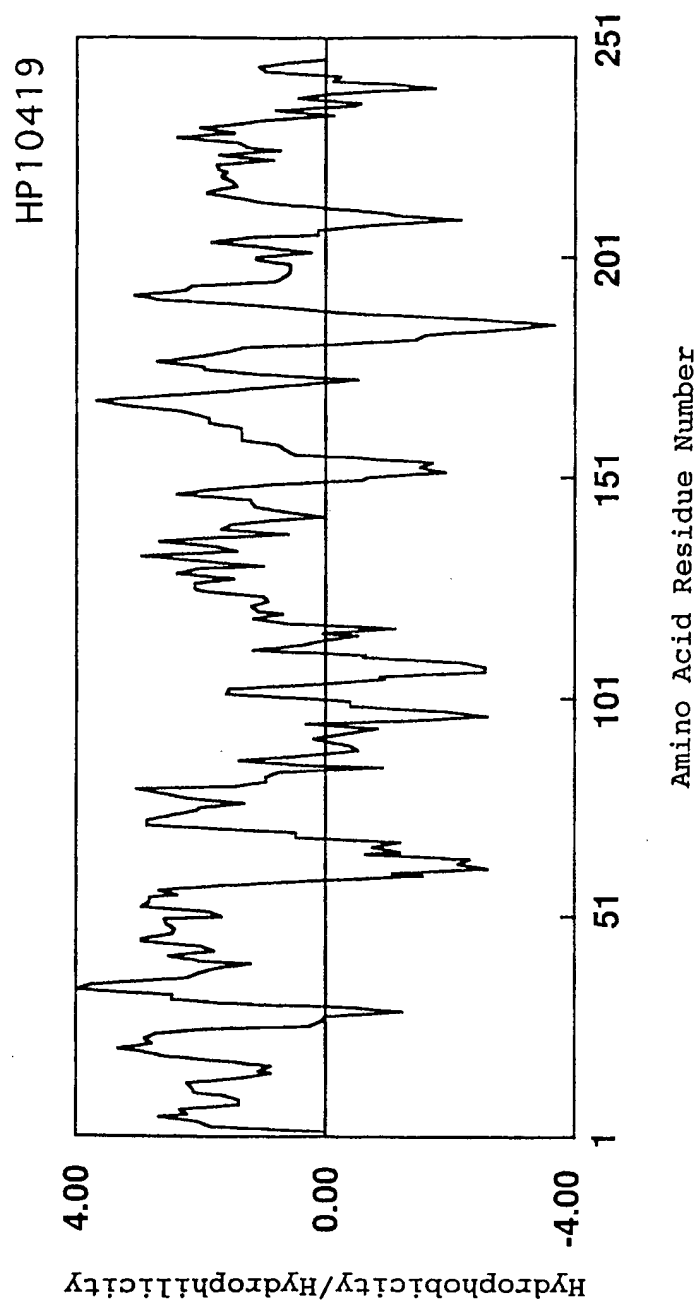


Fig.13

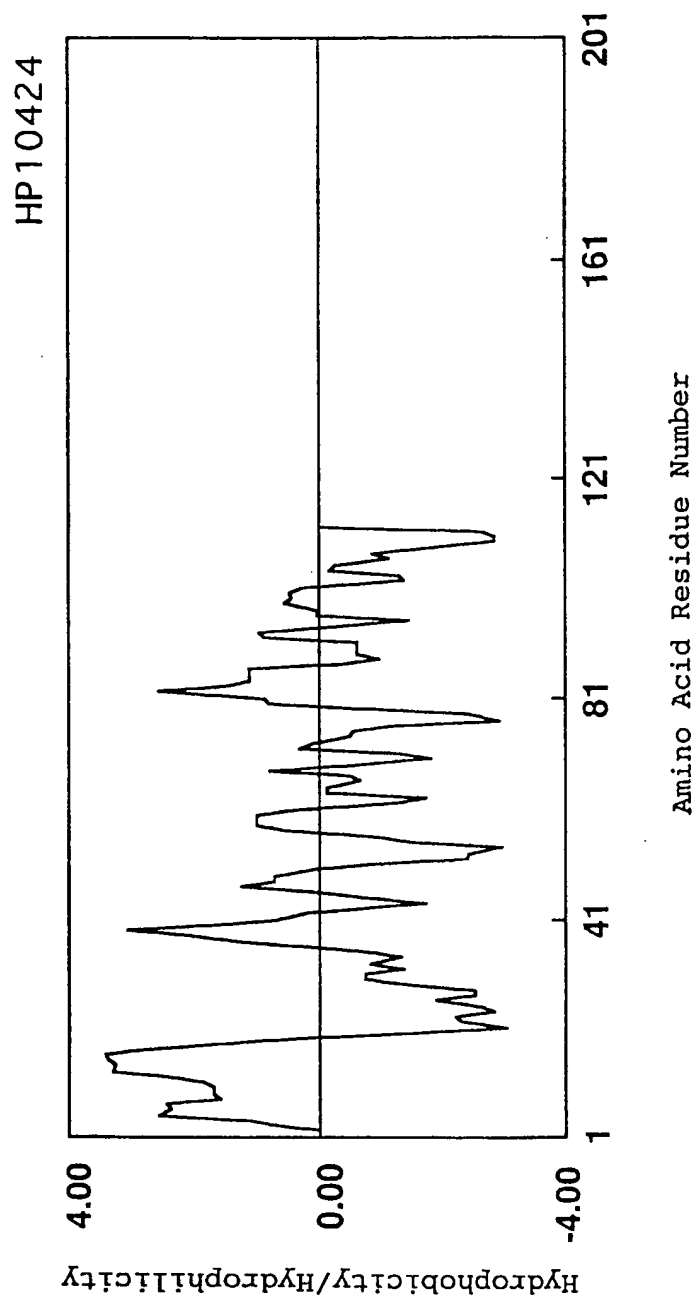


Fig.14

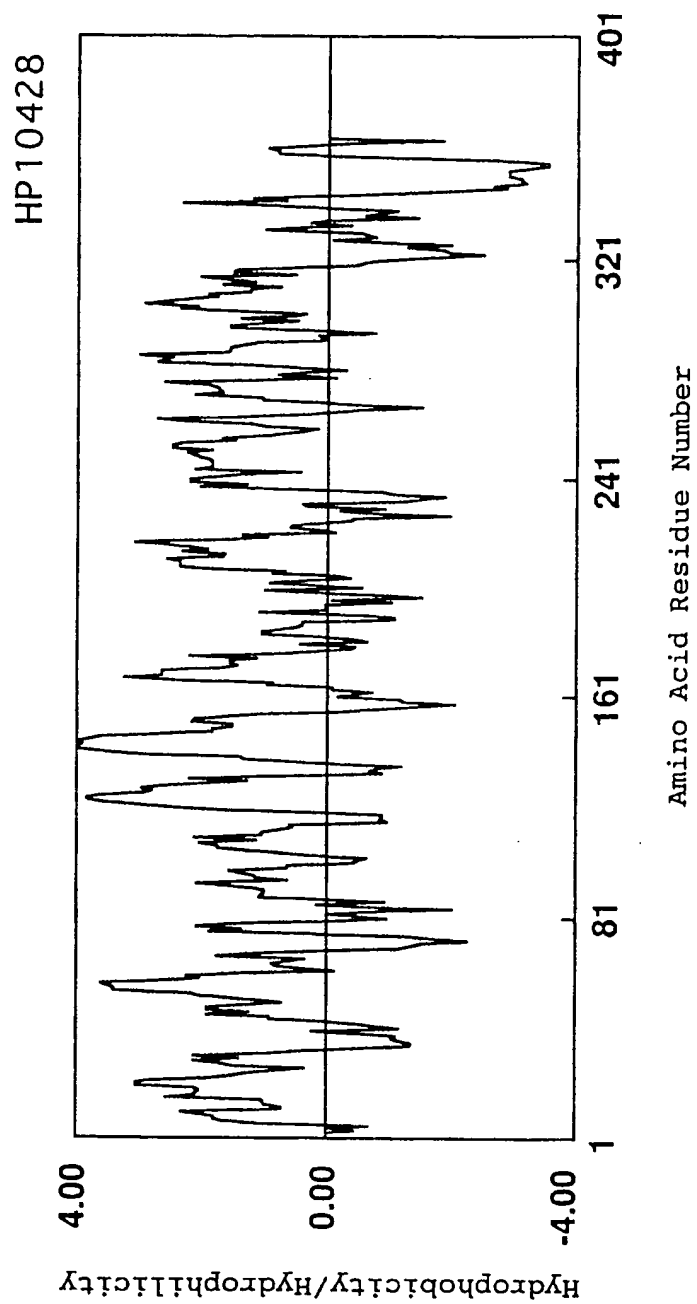


Fig.15

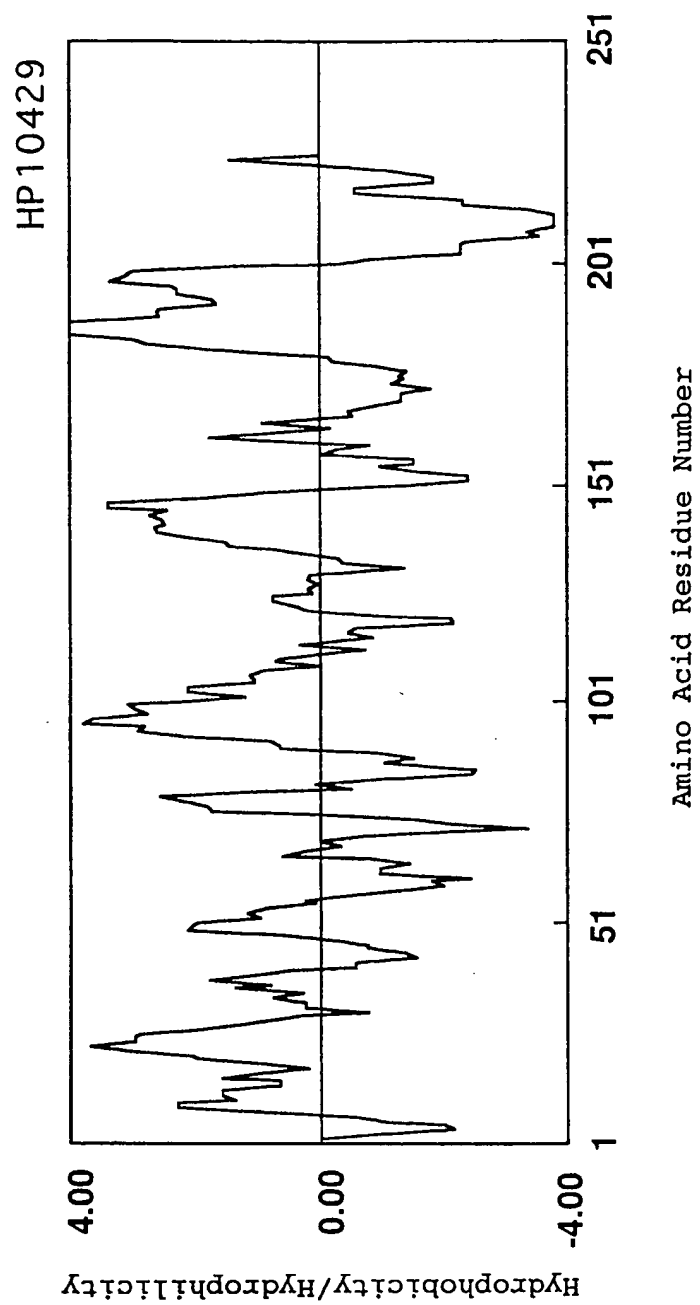


Fig.16

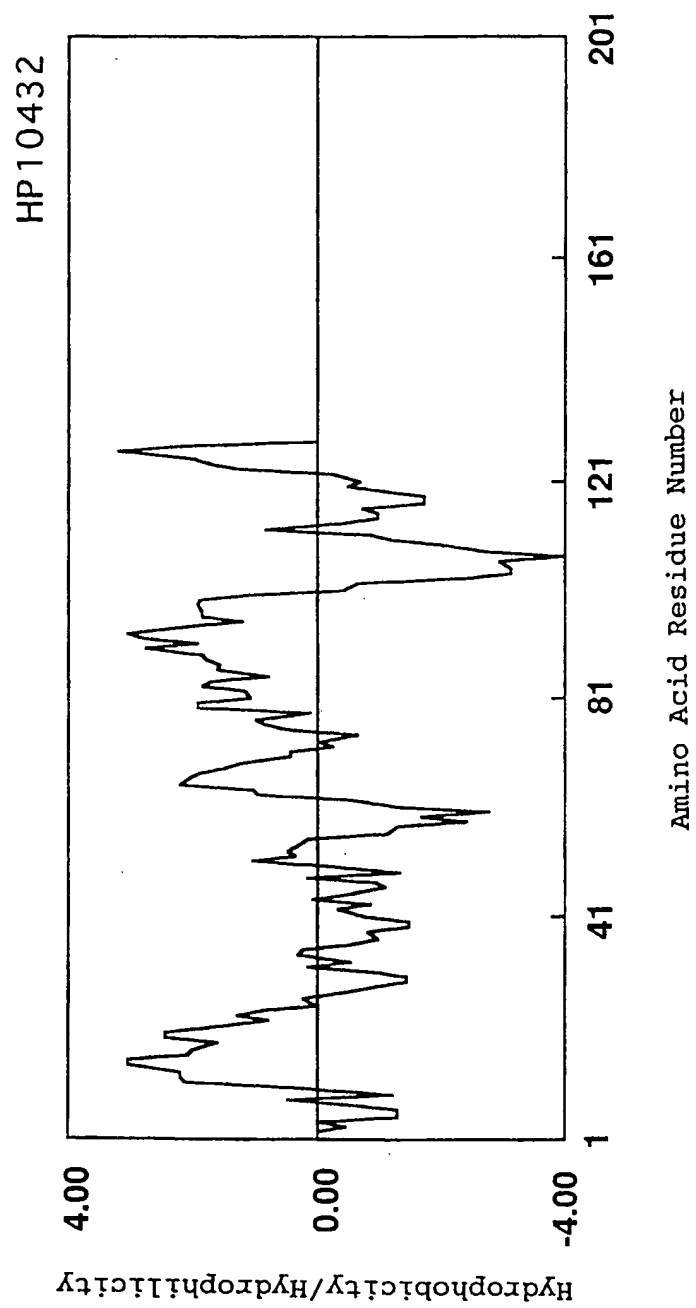


Fig.17



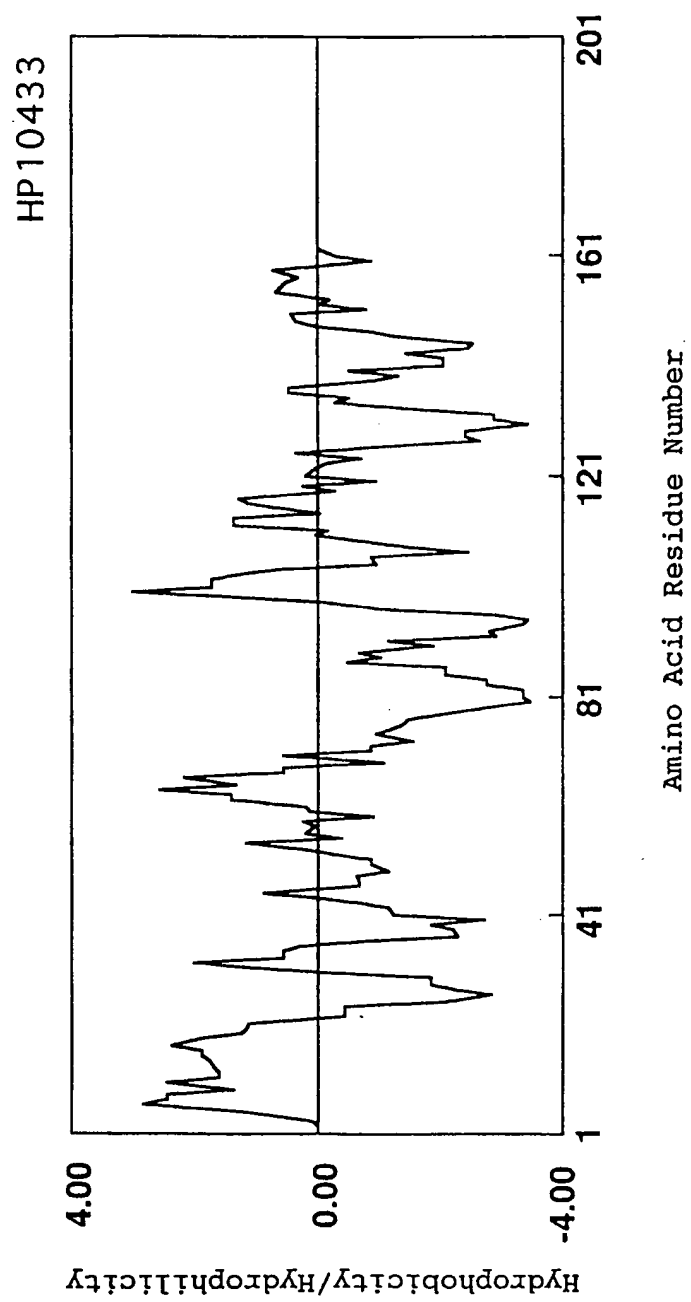


Fig.18

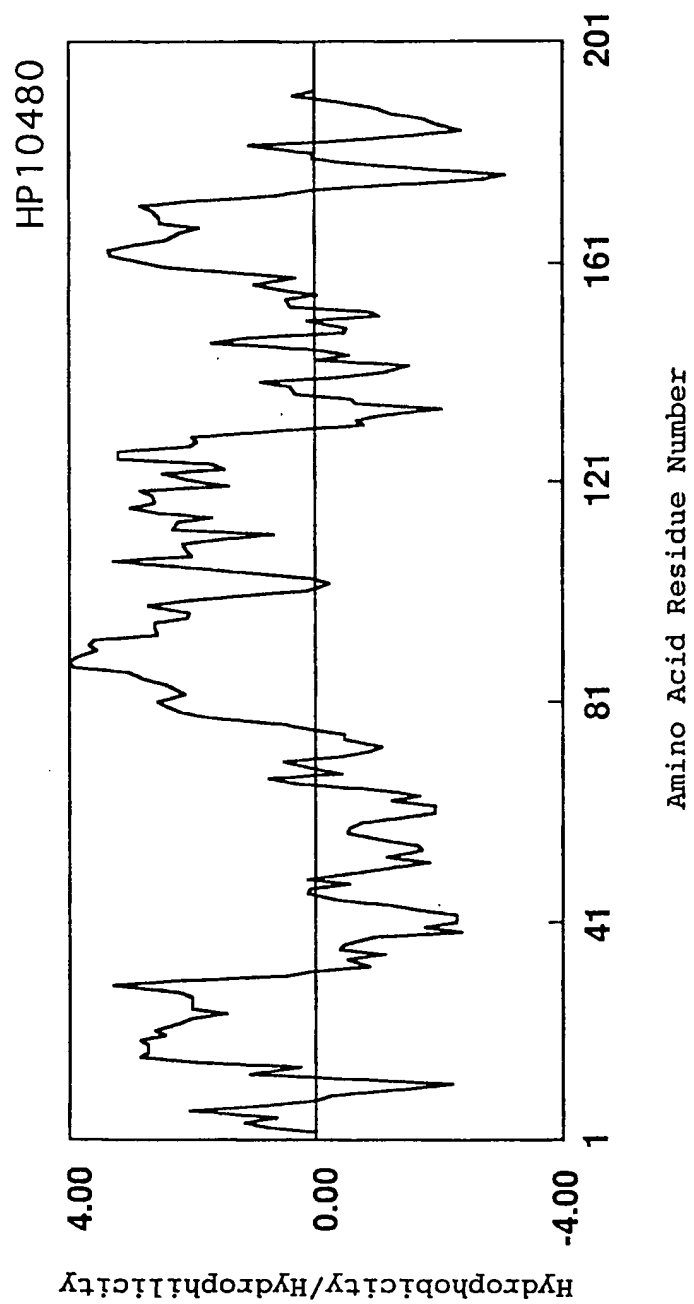


Fig.19

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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification</b> <sup>6</sup> : C12N 15/12, C07K 14/705, A61K 38/17, C12N 5/10, C12Q 1/37, C12N 9/72, 15/85	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 98/55508</b> <b>(43) International Publication Date:</b> 10 December 1998 (10.12.98)
<b>(21) International Application Number:</b> PCT/JP98/02445 <b>(22) International Filing Date:</b> 3 June 1998 (03.06.98)  <b>(30) Priority Data:</b> 9/144948      3 June 1997 (03.06.97)      JP  <b>(71) Applicants (for all designated States except US):</b> SAGAMI CHEMICAL RESEARCH CENTER [JP/JP]; 4-1, Nishi-Ohnuma 4-chome, Sagamihara-shi, Kanagawa 229-0012 (JP). PROTEGENE INC. [JP/JP]; 2-20-3, Naka-cho, Meguro-ku, Tokyo 153-0065 (JP).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> KATO, Seishi [JP/JP]; 3-46-50, Wakamatsu, Sagamihara-shi, Kanagawa 229-0014 (JP). SEKINE, Shingo [JP/JP]; Remonzu 101, 2-8-15, Atago, Ageo-shi, Saitama 362-0034 (JP). YAMAGUCHI, Tomoko [JP/JP]; 5-13-11, Takasago, Katsushika-ku, Tokyo 125-0054 (JP).  <b>(74) Agents:</b> AOYAMA, Tamotsu et al.; Aoyama & Partners, IMP Building, 3-7, Shiromi 1-chome, Chuo-ku, Osaka-shi, Osaka 540-0001 (JP).		<b>(81) Designated States:</b> AU, CA, JP, MX, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims</i> <i>and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 25 March 1999 (25.03.99)
<b>(54) Title:</b> HUMAN PROTEINS HAVING TRANSMEMBRANE DOMAINS AND DNAs ENCODING THESE PROTEINS  <b>(57) Abstract</b>  Proteins comprising any of the amino acid sequences of SEQ ID NOS: 1 to 18 and DNAs encoding said proteins and comprising any of the nucleotide sequences of SEQ ID NOS: 19 to 36 are provided.		

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# INTERNATIONAL SEARCH REPORT

International Application No  
PC1/JP 98/02445

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/12 C07K14/705 A61K38/17 C12N5/10 C12Q1/37  
C12N9/72 C12N15/85

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KYTE J. ET AL.: "A SIMPLE METHOD FOR DISPLAYING THE HYDROPATHIC CHARACTER OF A PROTEIN" JOURNAL OF MOLECULAR BIOLOGY, vol. 157, no. 1, 5 May 1982, pages 105-132, XP000609692 cited in the application ---	
A	LIBERT F. ET AL.: "SELECTIVE AMPLIFICATION AND CLONING OF FOUR NEW MEMBERS OF THE G PROTEIN-COUPLED RECEPTOR FAMILY" SCIENCE, vol. 244, 5 May 1989, pages 569-572, XP002041588 --- -/--	

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
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- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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- \*Z\* document member of the same patent family

Date of the actual completion of the international search

22 September 1998

Date of mailing of the international search report

26. 01. 99

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 98/02445

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	MILLS A. AND DUGGAN M.J.: "ORPHAN SEVEN TRANSMEMBRANE DOMAIN RECEPTORS: REVERSING PHARMACOLOGY" TRENDS IN BIOTECHNOLOGY, vol. 12, February 1994, pages 47-49, XP002078287	
A	Database EMBL, entry Emest7:HS010272 Accession number N39010 25 January 1996 99% identity with Seq.ID:19 nt.647-1146. XP002078288 see the whole document	2-4
A	Database EMBL, entry Emest9:HS204207 Accession number H57204 7 October 1995 96% identity with Seq.ID:19 nt.1-437. XP002078292 cited in the application see the whole document	2-4

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP 98/02445

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-6 : all partially (see subject 1, extra sheet)

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-6 all partially.

A protein comprising an aminoacid sequence as in Seq.ID:1, encoding DNA, as in Seq.ID:19 and 37, related expression vector and transformed eukaryotic cell.

2. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:2, 20 and 38.

3. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:3, 21 and 39.

4. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:4, 22 and 40.

5. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:5, 23 and 41.

6. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:6, 24 and 42.

7. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:7, 25 and 43.

8. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:8, 26 and 44.

9. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:9, 27 and 45.

10. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:10, 28 and 46.

11. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:11, 29 and 47.



FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

12. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:12, 30 and 48.

13. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:13, 31 and 49.

14. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:14, 32 and 50.

15. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:15, 33 and 51.

16. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:16, 34 and 52.

17. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:17, 35 and 53.

18. Claims: 1-6 all partially.

As invention 1 but concerning Seq.ID:18, 36 and 54.